



FINAL REPORT

Assessment of
Geology, Energy, and Minerals (GEM)
Resources

PUEBLO VALLEY
GEM RESOURCE AREA

(OR-020-21)

HARNEY COUNTY, OREGON

Prepared for

United States Department of the Interior
United States Bureau of Land Management
Scientific Systems Development Branch

March 1983

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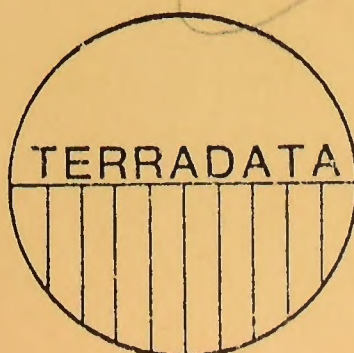
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Assessment of
Geology, Energy, and Minerals (GEM)
Resources

Pueblo Valley GRA
(OR - 020 - 21)
Harney County, Oregon

Prepared For:

United States Department of the Interior
United States Bureau of Land Management
Scientific Systems Development Branch

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March, 1983

This report was prepared as part of a Phase I Assessment of GEM
Resources within designated Wilderness Study Areas in Oregon, Idaho and
Nevada.

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- o Dr. Antonius Budding - Oil Shale and Tar Sands
- o Mr. Raymond Corcoran - Field Verification
- o Dr. James Firby - Paleontology
- o Mr. Ralph Mason - Coal
- o Mr. Richard Miller - Uranium and Thorium
- o Mr. Vernon Newton - Oil and Gas
- o Mr. Herbert Schlicker - Industrial Minerals and Geologic Hazards
- o Dr. Walter Youngquist - Geothermal
- o Dr. Paul Weis - Metals and Non - Metals.

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Mr. Tom Mitchell assisted in the stream sediment sampling program. Bondar - Clegg provided the geochemical analysis of stream sediment samples.

Ms. Pamela Ruhl provided clerical and editorial assistance throughout the project. Ms. Sara Mathews assisted with occurrence information and drafting. Mr. Philip R. Jones and Mr. Michael A. Becker produced all documents relating to the project using TERRADATA's word processing and document production systems.



EXECUTIVE SUMMARY

The purpose of this project is to evaluate and classify environments favorable for the occurrence of GEM resources in southeastern Oregon, southwestern Idaho, and northern Nevada. (See the TERRADATA report entitled "**Procedures for the Assessment of Geology, Energy, and Minerals (GEM) Resources.**") GEM resource environments have been rated on a scale that ranges from one to four, with one being least favorable and four being most favorable. Favorability classes two and three represent low and moderate favorability, respectively. Confidence levels range from A to D with A being low confidence and D being high confidence. The confidence levels are directly related to the quantity and quality of information available for determination of the favorability classes.

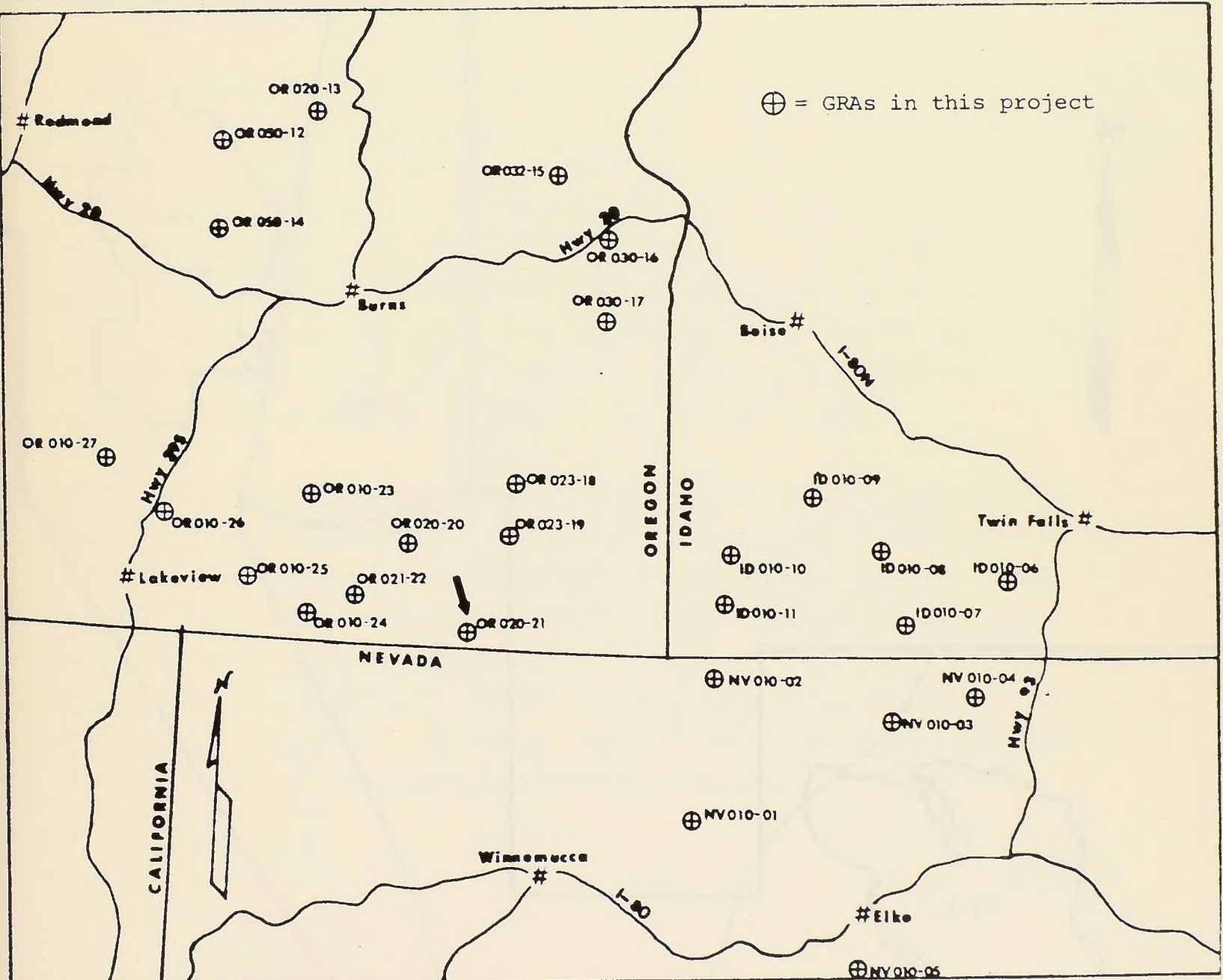
The specific area with which this report deals is the Pueblo Valley GEM resource area (GRA OR-020-21) which is located in south-central Oregon (see location map below). The GRA contains about 468 square miles within Townships 36S through 41S and Ranges 32 3/4E through 36E. It contains three WSAs; WSA 2-83, WSA 2-77, and WSA 2-78F which comprise 56,755 acres. The study area is in the Andrews Resource Area of the Burns BLM District. It is about 90 miles from Burns, Oregon.

The GRA is within the Great Basin sub-province of the Basin and Range physiographic province. It is underlain by rocks that range from Paleozoic miogeoclinal sediments to Tertiary volcanic and volcanoclastic strata. The area is west of the major structural Antler orogenic belt. Basin and Range fault blocks are common in this portion of Oregon.

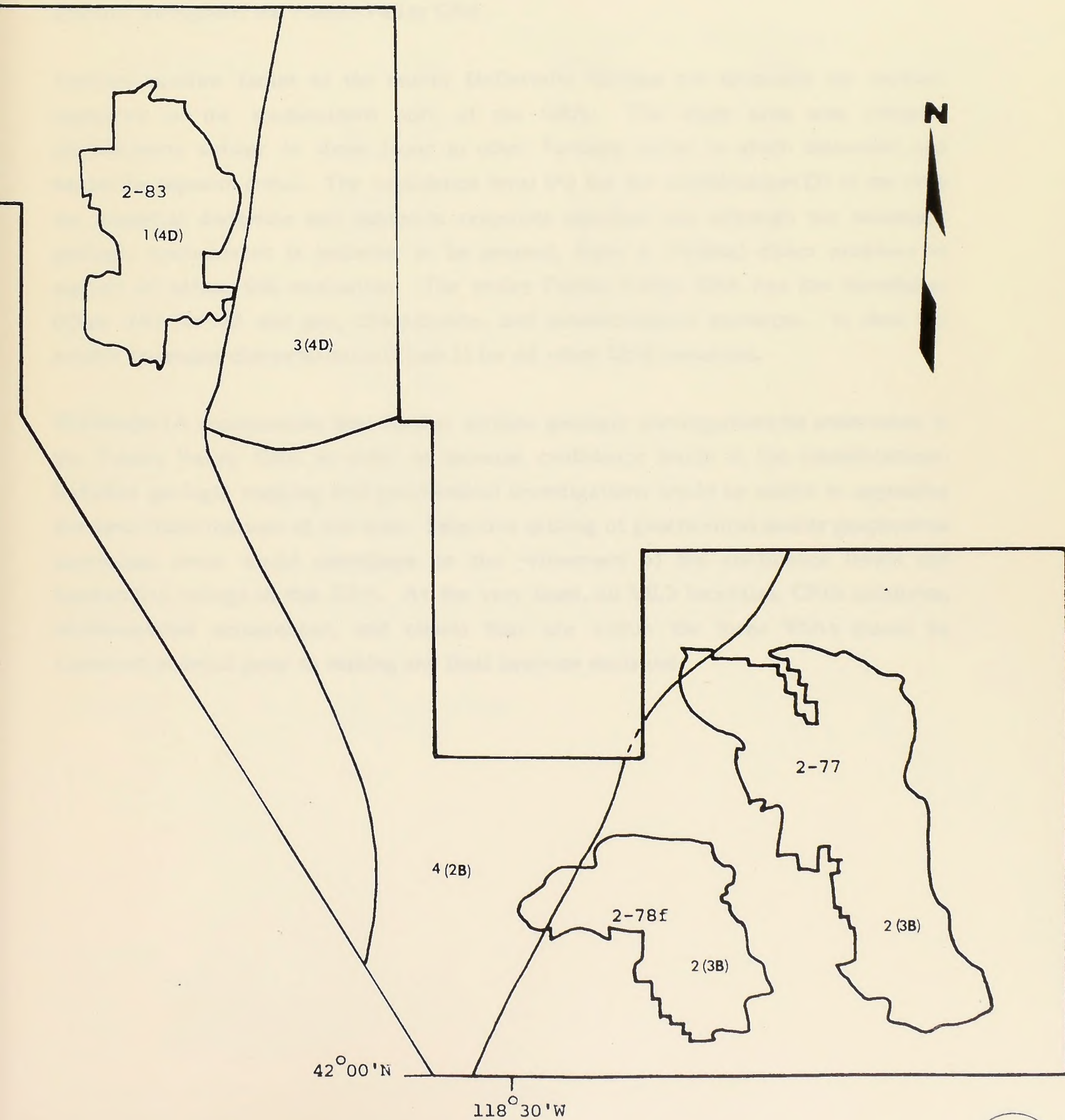
The Pueblo Valley GRA contains several geologic environments that are variously favorable for GEM resources. Parts of the study area are classified 4D and 3B for the occurrence of mercury deposits. Historically, these mercury occurrences also have contained associated copper mineralization as well as traces of other metals. The 4D rating for WSA 2-83 (Area 1-4D) signifies that the geologic environment, the inferred geologic processes, the reported mines, and the mineral occurrences indicate high favorability for the accumulation of mercury, and that the available data provide abundant direct evidence to support the possible existence of mineral resources (see Land Classification Map, below). WSAs 2-77 and 2-78F (Area 2-3B) are classified 3B for potential mercury deposits because there is not enough direct evidence to warrant a higher classification.



GRA Location Map



Land Classification Map
Pueblo Valley GRA
(OR - 020 - 21)
Harney County, Oregon



Scale 1:250,000
(Adel 1°x2° NTMS Quadrangles)

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Two subareas of the GRA (Area 3-4D and Area 4-2B) are classified favorable for the occurrence of geothermal resources in accordance with the BLM classification scheme. All three WSAs contain environments that have low favorability (Class 2B) for the occurrence of uranium resources. The Pike Creek Formation is generally favorable for uranium throughout the Pueblo Valley GRA.

Tertiary outflow facies of the nearby McDermitt Caldera are favorable for uranium resources in the southeastern part of the GRA. The study area also contains environments similar to those found in other Tertiary basins in which diatomite and bentonite deposits occur. The confidence level (A) for the classification (3) of the area for potential diatomite and bentonite resources signifies that although the necessary geologic environment is believed to be present, there is minimal direct evidence to support or refute this evaluation. The entire Pueblo Valley GRA has low favorability (Class 2A) for oil and gas, clinoptilolite, and paleontological resources. It does not exhibit favorable characteristics (Class 1) for all other GEM resources.

TERRADATA recommends that further surface geologic investigations be undertaken in the Pueblo Valley GRA in order to increase confidence levels in the classifications. Detailed geologic mapping and geochemical investigations would be useful in upgrading the land classifications of this area. Selective drilling of geochemical and/or geophysical anomalous areas would contribute to the refinement of the confidence levels and favorability ratings in this GRA. At the very least, all MILS localities, CRIB localities, NURE-related occurrences, and claims that are within the three WSAs should be examined in detail prior to making any final land-use decisions.

**Classification Of Lands Within The
Pueblo Valley GRA
(OR - 020 - 21)
Harney County, Oregon
For GEM Resource Potential**

<u>COMMODITY</u>	<u>AREA</u>	<u>CLASSIFICATION LEVEL</u>	<u>CONFIDENCE LEVEL</u>	<u>RE MARKS</u>
Metals	Area 1-4D	4	D	Hg, Cu, minor ac- cessory metals
	Area 2-3B	3	B	
	Rest of GRA	2	B	
Geothermal	Area 3-4D	4	D	
	Area 4-2B	2	B	
	Rest of GRA	1	D	
Uranium/Thorium	Entire GRA	2	B	
Coal	Entire GRA	1	C	
Oil and Gas	Entire GRA	2	A	
Tar Sands/Oil Shale	Entire GRA	1	C	
Limestone	Entire GRA	1	C	
Bentonite	Entire GRA	3	A	
Diatomite	Entire GRA	3	A	
Clinoptilolite	Entire GRA	2	A	
Paleontology	Entire GRA	2	A	
Hazards	See Hazards Map (GRA File)			
ESLs	None	1	C	

LEGEND:

Class 1 - Least
Class 2 - Low Favorability
Class 3 - Moderate Favorability
Class 4 - High Favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

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1. INTRODUCTION

This report is one of 27 GRA technical reports that summarize the results of a Phase I assessment of the geology, energy, and minerals (GEM) resources in selected portions of southeastern Oregon, southwestern Idaho, and northern Nevada. The study region was subdivided into 27 GEM resource areas (GRAs), principally for ease of data management and interpretation. The assessment of GEM resources for this project consisted of an interpretation of existing literature and information by experts knowledgeable in both the geographic area and specific commodities. It is possible that the assessment would be different if detailed field exploration, geochemical sampling, and exploratory drilling programs were undertaken. (See the TERRADATA report entitled "Procedures for the Assessment of Geology, Energy, and Minerals (GEM) Resources.")

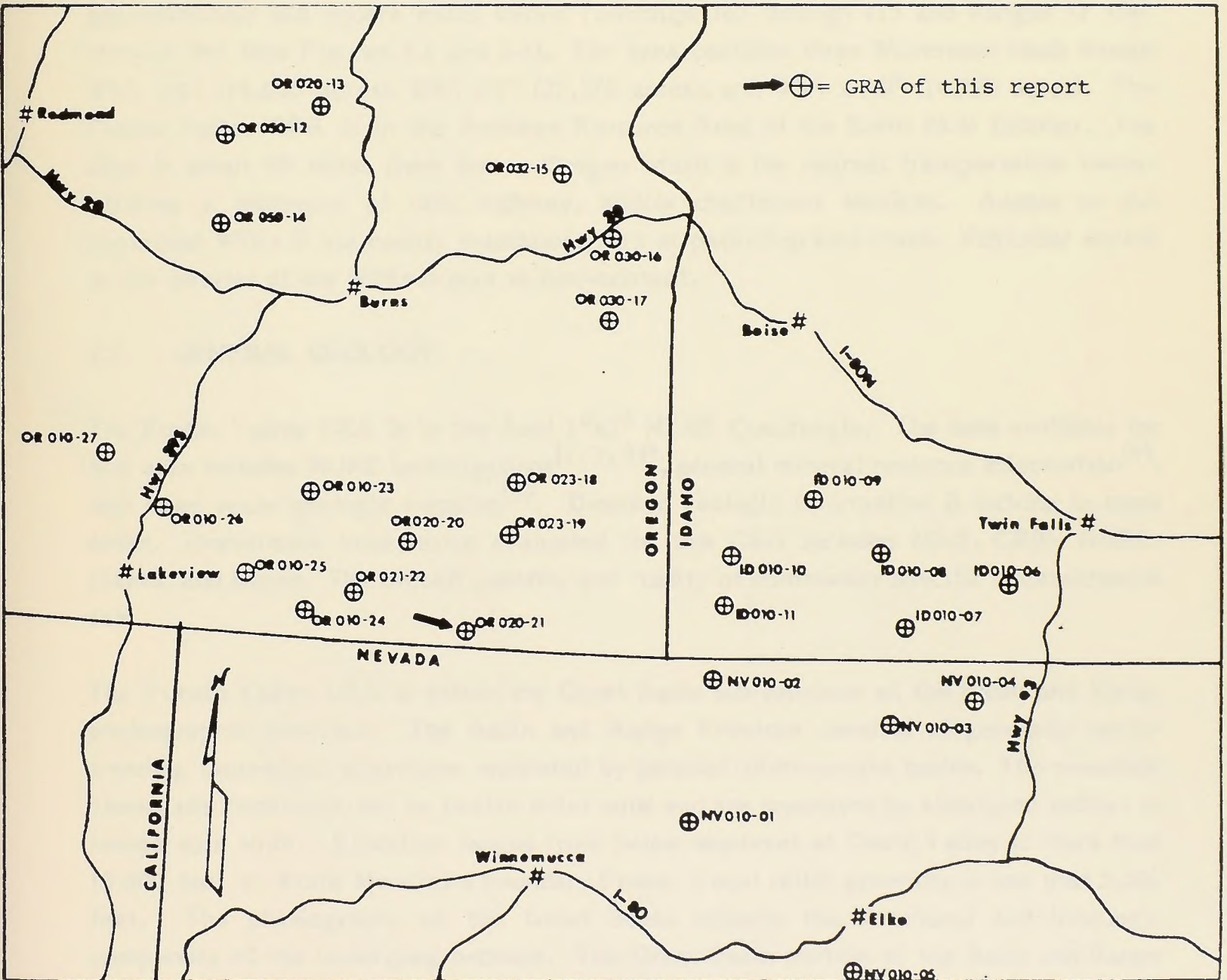
This report summarizes the assessment of the GEM resources potential of the Pueblo Valley GRA (OR-020-21). See Figure 1-1. Commodity categories for which this GRA was evaluated are:

- o Metals
- o Oil and Gas
- o Oil Shale and Tar Sands
- o Geothermal
- o Uranium and Thorium
- o Coal
- o Industrial Minerals
- o Paleontological Resources
- o Geologic Hazards
- o Educational and Scientific Localities (ESLs)

Geologic environments within the Pueblo Valley GRA have been rated with respect to their favorability for the occurrence of these different commodities. The favorability rating scale ranges from one to four, with one being least favorable and four being most favorable. Confidence levels in these ratings also have been assigned. These confidence levels range from A to D, with A being low confidence and D high confidence. Assigned confidence levels are related to the quantity and quality of the information available for the determination of the favorability ratings.



FIGURE 1-1
GRA Location Map



2. DESCRIPTION OF THE PUEBLO VALLEY GRA

2.1 LOCATION

The Pueblo Valley GRA (OR-020-21) is in south-central Oregon. It lies between latitudes $42^{\circ}00'N$ and $42^{\circ}27'N$ and longitudes $118^{\circ}14'W$ and $118^{\circ}48'W$. The GRA contains approximately 468 square miles within Townships 36S through 41S and Ranges $32\frac{3}{4}E$ through 36E (see Figures 1-1 and 2-1). The area contains three Wilderness Study Areas; WSA 2-83 (14,655 acres), WSA 2-77 (27,370 acres), and WSA 2-78F (14,730 acres). The Pueblo Valley GRA is in the Andrews Resource Area of the Burns BLM District. The area is about 90 miles from Burns, Oregon which is the nearest transportation center offering a minimum of rail, highway, and/or charter-air services. Access to the contained WSAs is via county maintained dirt or packed-gravel roads. Vehicular access to the interior of the WSAs is poor to non-existent.

2.2 GENERAL GEOLOGY

The Pueblo Valley GRA is in the Adel $1^{\circ}x2^{\circ}$ NTMS Quadrangle. The data available for this area includes NURE investigations^{(1, 2, 3)*}, general mineral resource information⁽⁴⁾, and large scale geologic mapping⁽⁵⁾. Detailed geologic information is lacking in most areas. Occurrence information evaluated for this GRA includes MILS, CRIB, NURE, claims, and leases. The overall quantity and quality of commodity specific information is fair.

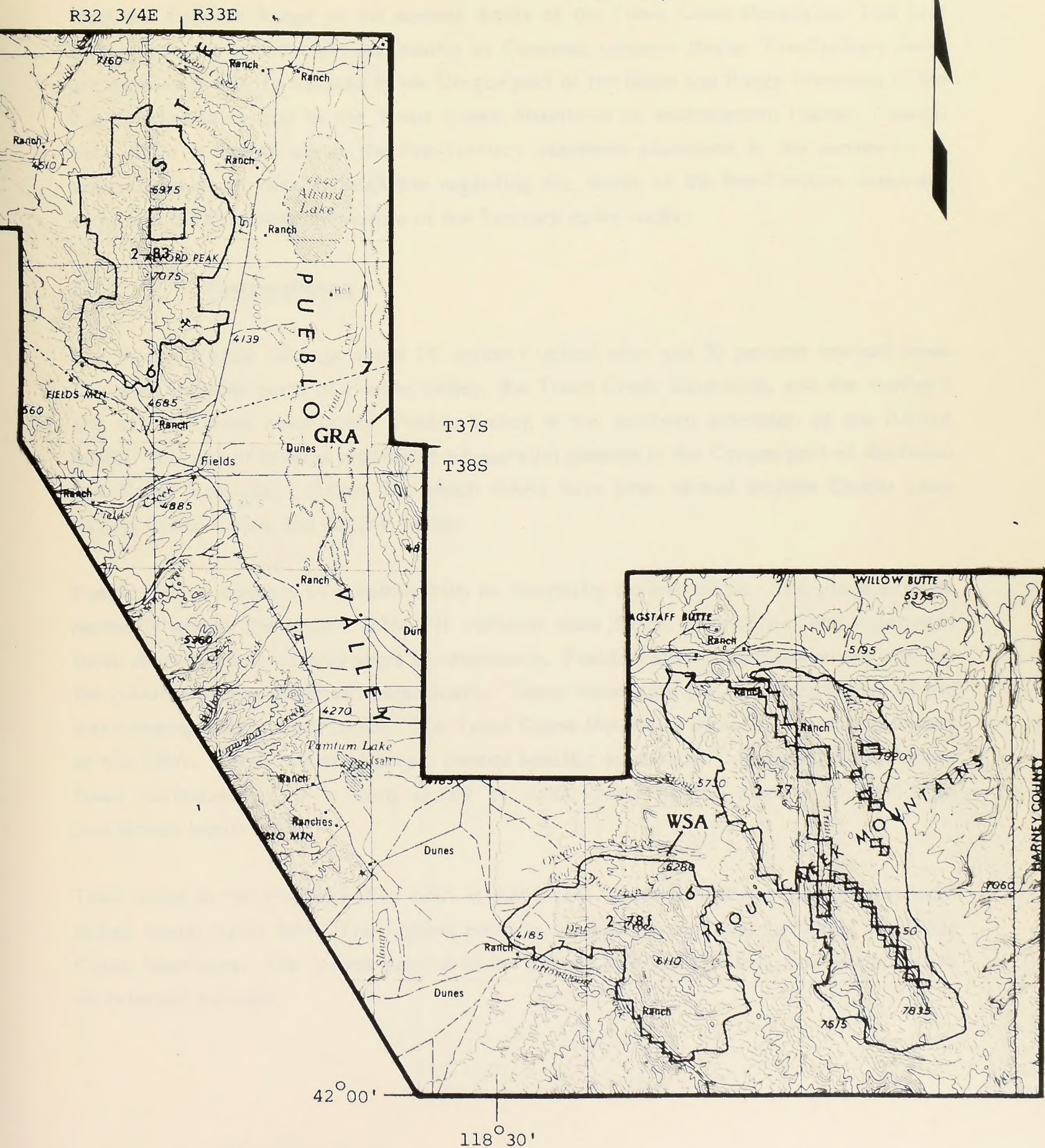
The Pueblo Valley GRA is within the Great Basin sub-province of the Basin and Range physiographic province. The Basin and Range Province consists of generally north-trending fault-block mountains separated by parallel intermontane basins. The mountain blocks are commonly ten to twelve miles wide and are separated by alluviated valleys of comparable width. Elevation ranges from below sea-level at Death Valley to more than 13,000 feet at White Mountains Boundary Peaks. Local relief generally is less than 5,000 feet. The physiography of the Great Basin reflects the structural and lithologic complexity of the underlying bedrock. The Great Basin portion of the Basin and Range Province extends from southern Nevada northward into southern Oregon. The northernmost extremity is located just north of the town of Burns, Oregon.

* In this report, citations are superscripted numbers. They refer to bibliographic entries listed in Appendix A, References Cited.



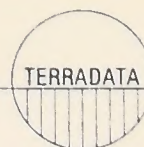
FIGURE 2-1

Topographic Map
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon



Scale 1:250,000
(Adel 1°x2° NTMS Quadrangle)

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The part of the Basin and Range Province that lies in southern Oregon extends eastward from the Cascade Range to the eastern limits of the Trout Creek Mountains. This part of the province is underlain dominantly by Cenozoic volcanic strata. Pre-Tertiary rocks are exposed in only two places in the Oregon part of the Basin and Range Province; in the Pueblo Mountains and in the Trout Creek Mountains of southeastern Harney County. Very little is known about the Pre-Tertiary basement elsewhere in the province. A sparse amount of data is available regarding the depth to the Pre-Tertiary basement rocks and the thickness and nature of the Tertiary cover rocks.

2.2.1 Geomorphology

The Pueblo Valley GRA is about 70 percent upland area and 30 percent lowland area. The area includes parts of Pueblo Valley, the Trout Creek Mountains, and the southern end of the Steens Mountains. Pueblo Valley is the southern extension of the Alvord Basin. It is one of several prominent sub-parallel grabens in the Oregon part of the Basin and Range Province. Others for which GRAs have been named include Crump Lake Valley, Guano Valley and Catlow Valley.

Pueblo Valley consists of a bolson with an internally drained playa. The playa extends northerly across the entire GRA. It contains dune fields, strandlines, and ephemeral lakes characteristic of arid playa environments. Pueblo Valley is bounded on the west by the massive Steens Mountain escarpment. These mountains are the eastern edge of the west-dipping Steens fault block. The Trout Creek Mountains occur in the southeast part of the GRA. They consist of deeply incised basaltic to andesitic highlands. Trout Creek flows northwesterly in a deep (1,800 to 2,000 feet) canyon that is rimmed with precipitous basalt cliffs.

Total relief in the Pueblo Valley GRA is 3,800 feet. Alvord Peak has the greatest local relief, nearly 3,000 feet. The highest point in the GRA (over 8,000 feet) is in the Trout Creek Mountains. The lowest point is in the bottom of Pueblo Valley. Pueblo Valley has no external drainage.



**Geologic Map
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon**

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FIGURE 2-2
(Continued)

**Geologic Map Legend For
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon**

- Qp - Playa Deposits
- Qal - Alluvium
- QTp - Pyroclastic Rocks of Basaltic Cinder Cones
- QTls - Landslide Debris
- QTs - Lacustrine, Fluvial, and Aeolian Sedimentary Rocks
- QTvf - Large, Complex Exogeneous Domes and Related Flows and Flow Breccias of Rhyodacitic Composition
- QTvm - Strato-Volcanoes Dominantly of Basaltic or Andesitic Composition
- QTba - Basalt and Andesite
- Tst - Semi-Consolidated Lacustrine Tuffaceous Sandstone and Siltstone, Ash and Ashy Diatomite, Conglomerate and Minor Conglomerate, Boulder-Bearing Slope Wash, Vitric-Crystal and Vitric-Lithic Tuff, Pumice Lapilli Tuff, and Tuff Breccia
- Tob - Thin, Vesicular, Subophytic to Intergranular, Diktytaxitic Basalt Flows
- Tb - Basalt
- Tts - Fine-Grained Tuffaceous Sedimentary Rocks and Tuffs
- Taf - Platy Andesite Flows
- Tbf - Massive Basalt Flows and Minor Interbeds of Tuff and Scoria
- Tvp - Tuffaceous Sedimentary Rocks and Tuffs
-  - Fault (dashed where inferred).
-  - Geologic contact (dashed where inferred).

2.2.2 Lithology and Stratigraphy

The predominant rock unit in the Pueblo Valley GRA is the Steens Mountain Basalt. This is a series of massive basalt flows with minor amounts of interbedded tuffs and tuff breccias. On top of the Steens Mountain Basalt are scattered exposures of tuffaceous sediments. These include semiconsolidated tuffaceous lacustrine sandstones and siltstones, ashy diatomaceous sediments, conglomerates and fanglomerates. Quaternary lacustrine and fluvial sediments of unknown thickness occupy the bolson of Pueblo Valley. Some of these sediments have been reworked into aeolian landforms.

2.2.3 Structural Geology

The tri-state area of northeastern Nevada, southern Oregon, and southwestern Idaho is characterized by several major structural elements. During the Early Paleozoic this area was the site of marine sedimentation in the north-northeast trending Cordilleran geosyncline. Sedimentation persisted in three sub-parallel belts until the end of the Devonian Period. One sedimentation belt was located in the eastern half of Nevada and received nearshore to littoral deposits of shallow-water carbonates with a minor amount of interbedded shale and sandstone. The second sedimentation belt was in the western half of the state and was the locus of transitional, progressively deeper-water deposits. The third belt, located further west, was the site of eugeoclinal deposits.

In Late Devonian time, the Antler Orogeny developed along a north-northeast trending swath through northwest Elko County, Nevada, and on into southwestern Idaho. The Pueblo Valley GRA lies west of the axis of the Antler orogenic belt. As a direct result of the Antler orogenic uplift, a Pennsylvanian clastic wedge developed along the margins of the uplift. The orogeny culminated in a period of extensive thrust faulting that includes the Roberts' Mountain thrust.

The Sonoma Orogeny occurred in the Permian in north-central Nevada⁽⁶⁾. This deformational episode included more thrust faulting south of the Pueblo Valley GRA.

Another structural episode in this area was Basin and Range block faulting in response to extensional forces. The Pueblo Valley GRA has been most notably effected by this structural episode. Major Basin and Range faults occur along the margins of the valley. Farther to the north the Pueblo-Steens fault block has a vertical displacement of several thousand feet.



2.2.4

Paleontology

Late Tertiary and Early Quaternary sedimentary rocks within the Pueblo Valley GRA may contain several varieties of flora and fauna. Tuffaceous lacustrine sediments contain Late Miocene mammalian vertebrate fauna in fine-grained sandstone and siltstone facies⁽⁷⁾. Tertiary diatomites may contain occasional fish and leaf fossils common to lacustrine environments. All other exposed volcanic lithologies are essentially devoid of fossils. Mesozoic rocks that occur in the GRA do not contain recognizable fossil assemblages because of the degree of metamorphism to which they have been subjected.

2.2.5

Historical Geology

The present geologic character of the Great Basin resulted from the progressive development of the western portion of the North American continent throughout geologic time. Beginning in the Late Precambrian and continuing into the Middle Paleozoic, eastern Nevada, western Utah, southwesternmost Idaho were characterized by a miogeoclinal environment in which shelf margin carbonates, shales, and sandstones were deposited. In contrast, western Nevada and southern Oregon were in a eugeoclinal environment in which dark shales, radiolarian cherts and basaltic materials (Steinman's Trinity) were formed.

The Middle Paleozoic (Late Devonian-Early Mississippian) Antler Orogeny deformed and thrust the eugeoclinal sediments over the shelf-type sediments to the east, resulting in a north-trending highland in Central Nevada. A vast amount of fine-grained detritus was shed eastward during the Mississippian, producing thick upper Paleozoic shales in eastern Nevada and western Utah. Erosion of the Antler Highlands resulted in the deposition of coarse sediments during the Early Pennsylvanian. Thousands of feet of sandstone and conglomerate were deposited in northern Nevada around the margins of the Antler Highlands. Late Pennsylvanian and Permian shallow-water sediments overlapped and overstepped the roots of the eroded highlands. Sediments deposited over the eroded Antler Highlands in the Permian were predominantly of the deep-water variety. The next significant tectonic episode (the Sonoma Orogeny) thrust the ocean floor siliceous and volcanic materials eastward over the shallow-water, clastic sedimentary rocks that covered the ancient Antler Highland.

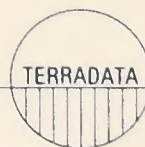
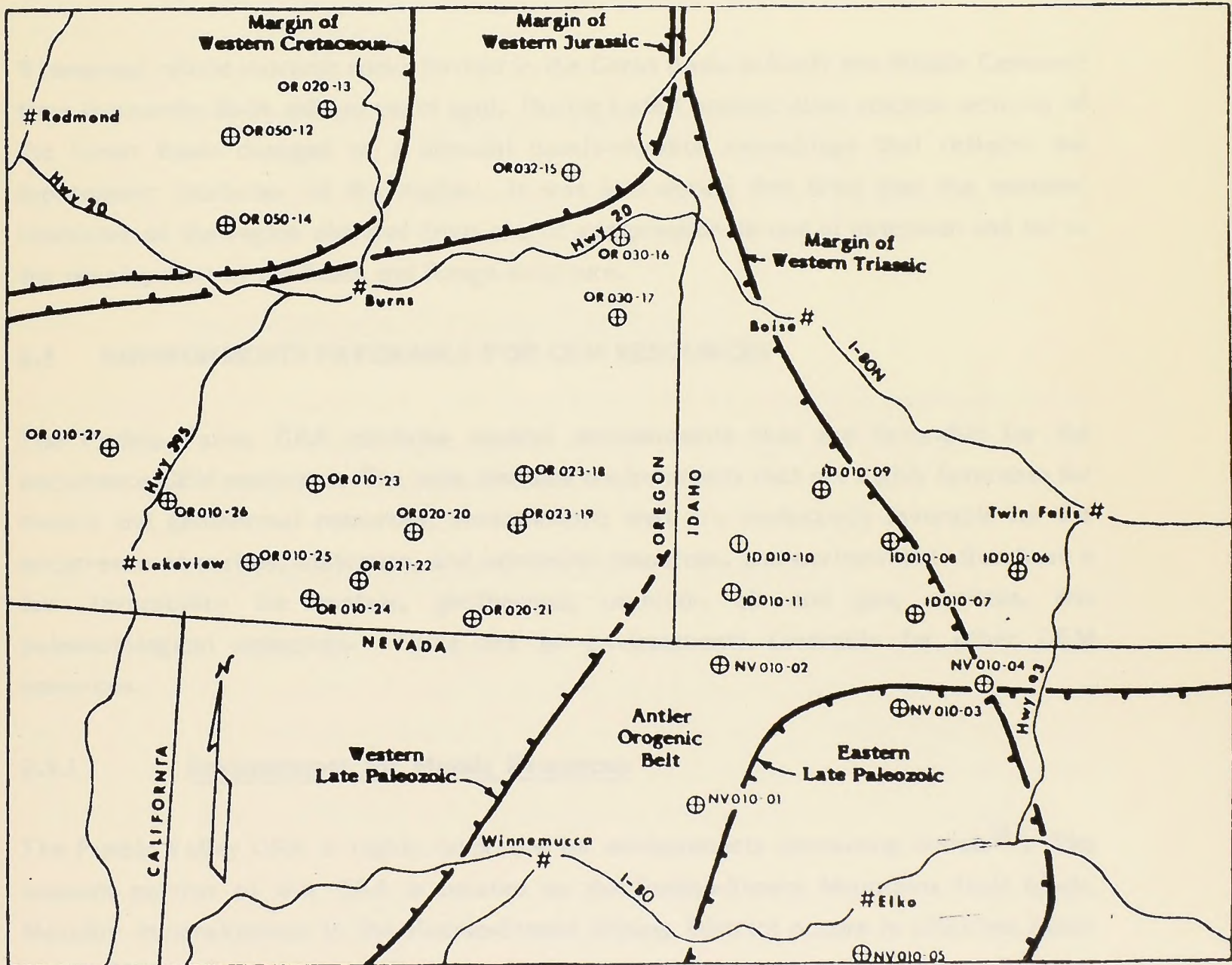


FIGURE 2-3
Paleogeographic Map⁽⁶⁾
Oregon-Idaho-Nevada
Tri-State Area



Development of western North American in the Mesozoic was dominated by oceanic plate subduction along the continental margin that resulted in a complex history of concomittant sedimentation, deformation, and igneous activity. During this time, the well-defined overthrust belt that extends from Canada to Mexico was formed. This deformation occurred during the Sevier (Late Jurassic to Latest Cretaceous) and Laramide orogenies (Latest Cretaceous to Early Tertiary Eocene).

Widespread silicic volcanic rocks formed in the Great Basin in Early and Middle Cenozoic time (primarily 20-34 million years ago). During Late Cenozoic time volcanic activity of the Great Basin changed to a bimodal basalt-rhyolite assemblage that reflects the taphrogenic character of the region. It was also during this time that the tectonic character of the region changed from one of compression to one of extension and led to the development of the Basin and Range structure.

2.3 ENVIRONMENTS FAVORABLE FOR GEM RESOURCES

The Pueblo Valley GRA contains several environments that are favorable for the occurrence GEM resources. The area contains environments that are highly favorable for metals and geothermal resources, environments that are moderately favorable for the occurrence of metals, diatomite, and bentonite resources, and environments that have a low favorability for metals, geothermal, uranium, oil and gas, zeolites, and paleontological resources. There are no environments favorable for other GEM resources.

2.3.1 Environments for Metals Resources

The Pueblo Valley GRA is highly favorable for environments containing metals⁽⁸⁾. The western portion of this GRA is located on the Pueblo-Steens Mountains fault block. Metallic mineralization in the Pueblo-Steens Mining District occurs in silicified fault-zones in pre-Tertiary and Tertiary lavas and related volcanic rocks. Primary commodities that occur in the district are mercury and copper minerals, accompanied locally by accessory gold.

2.3.2 Environments for Oil and Gas Resources

The Pueblo Valley GRA has a low favorability for potential oil and gas resources.



Potentially favorable sub-surface environments include western Triassic and western Late Paleozoic formations, and Miocene Lake Bruneau units⁽⁶⁾. However, metamorphism of Paleozoic and Mesozoic units in this area may have driven off any potential hydrocarbon accumulations. Because prospective environments are overlain by Tertiary volcanics most of the evidence is indirect. If the environments favorable for the accumulation of oil and gas do exist, then the associated Basin and Range faults might provide essential structural traps.

2.3.3 Environments for Oil Shale and Tar Sands Resources

The Pueblo Valley GRA contains no environments favorable for the occurrence of oil shale or oil impregnated sand⁽⁹⁾. Favorable lithologies are not present.

2.3.4 Environments for Geothermal Resources

Favorable recognition criteria for geothermal resource environments in the Pueblo Valley GRA include part of a KGRA, major faults, high geothermal gradients in test-wells, and favorable proprietary geophysical data⁽¹⁰⁾.

2.3.5 Environments for Uranium and Thorium Resources

The Pike Creek Formation is favorable for the occurrence of uranium deposits in the Pueblo Valley GRA because of several occurrences on the east slope of Steens Mountain (north of WSA 2-83) outside of the GRA. Vein-breccia deposits on Steens Mountain reach one percent U_3O_8 in selected samples. The Steens Mountain district has been designated a "speculative uranium potential area" by the United States Department of Energy.

Four uranium occurrences are listed in old reports in the general Trout Creek Mountains area (in the southeast part of the GRA), but data are lacking as to the exact locations and the significance of these occurrences⁽¹¹⁾.

2.3.6 Environments for Coal Resources

The Pueblo Valley GRA is not favorable for the occurrence of coal and lignite deposits⁽¹²⁾. The chances for coal or carbonaceous materials to have formed in the study area are remote. The geology of the Pueblo Valley GRA region does not support



environments favorable for the formation of coal deposits. The area is underlain or is mantled with accumulations of highly tuffaceous sediments and related volcanic products. There is no evidence to support the inference that a coal-forming environment existed within this GRA.

2.3.7 Environments for Industrial Minerals Resources

The Pueblo Valley GRA contains environments favorable for the accumulation of diatomite, zeolites (clinoptilolite), and bentonite resources. Environments favorable for diatomite occur in lacustrine strata interbedded with volcanic sequences. Bentonite and clinoptilolite may occur as alteration products of volcanic and volcanoclastic rocks in the GRA⁽¹³⁾.

2.3.8 Environments for Paleontological Resources

Environments within the Pueblo Valley GRA for paleontological resources may occur in minor lacustrine and fluvial volcanic sequences of the GRA. Older Mesozoic strata are not favorable because of the high degree of metamorphism⁽⁷⁾.

2.3.9 Environments for Geologic Hazards

Potential geologic hazards in the Pueblo Valley GRA consist of mapped and interpreted faults, landslides, and/or volcanic centers⁽¹³⁾. These features were noted from aerial photographs, geologic maps, and topographic maps. There is no historical record of violent seismic or volcanic activity in the area. The potential for mass movement exists along all over-steepened slopes within the GRA.

2.3.10 Educational and Scientific Localities

There are no known ESLs in the Pueblo Valley GRA.



3. ENERGY AND MINERAL RESOURCES IN THE PUEBLO VALLEY GRA

The Pueblo Valley GRA is favorable for the occurrence of several GEM resources.

3.1 KNOWN DEPOSITS

The Pueblo Valley GRA contains hydrothermal mercury deposits in the northwestern part of the GRA.

3.2 OCCURRENCES

The Pueblo Valley GRA contains 15 CRIB localities (Figure 3-1, Appendix B) that are mercury, copper and associated metallic occurrences. The GRA contains 15 MILS cluster localities (Figure 3-2, Appendix C) for a total of 26 individual records. The majority of these records are for mercury occurrences. However, there are records that refer to associated metals, diatomite, and geothermal occurrences. NURE-related uranium occurrences are located just north of the GRA in the Pueblo-Steens Mining District and southeast of the area in the McDermitt Caldera.

3.3 CLAIMS

The Pueblo Valley GRA contains 768 mining claims as of 15 August, 1982. (Figure 3-3). Claims occur within WSA 2-83 in the northern part of the GRA and in WSA 2-77 in the eastern part of the GRA. Most of the claims are clustered around Pueblo Mountain and Flagstaff Butte. Most of the claims near Pueblo Mountain are related to precious metals. The claims at Flagstaff Butte are primarily uranium related whereas the claims east of Flagstaff Butte are for uranium and diatomite (personal communication with G. Brown, Burns BLM District Office).

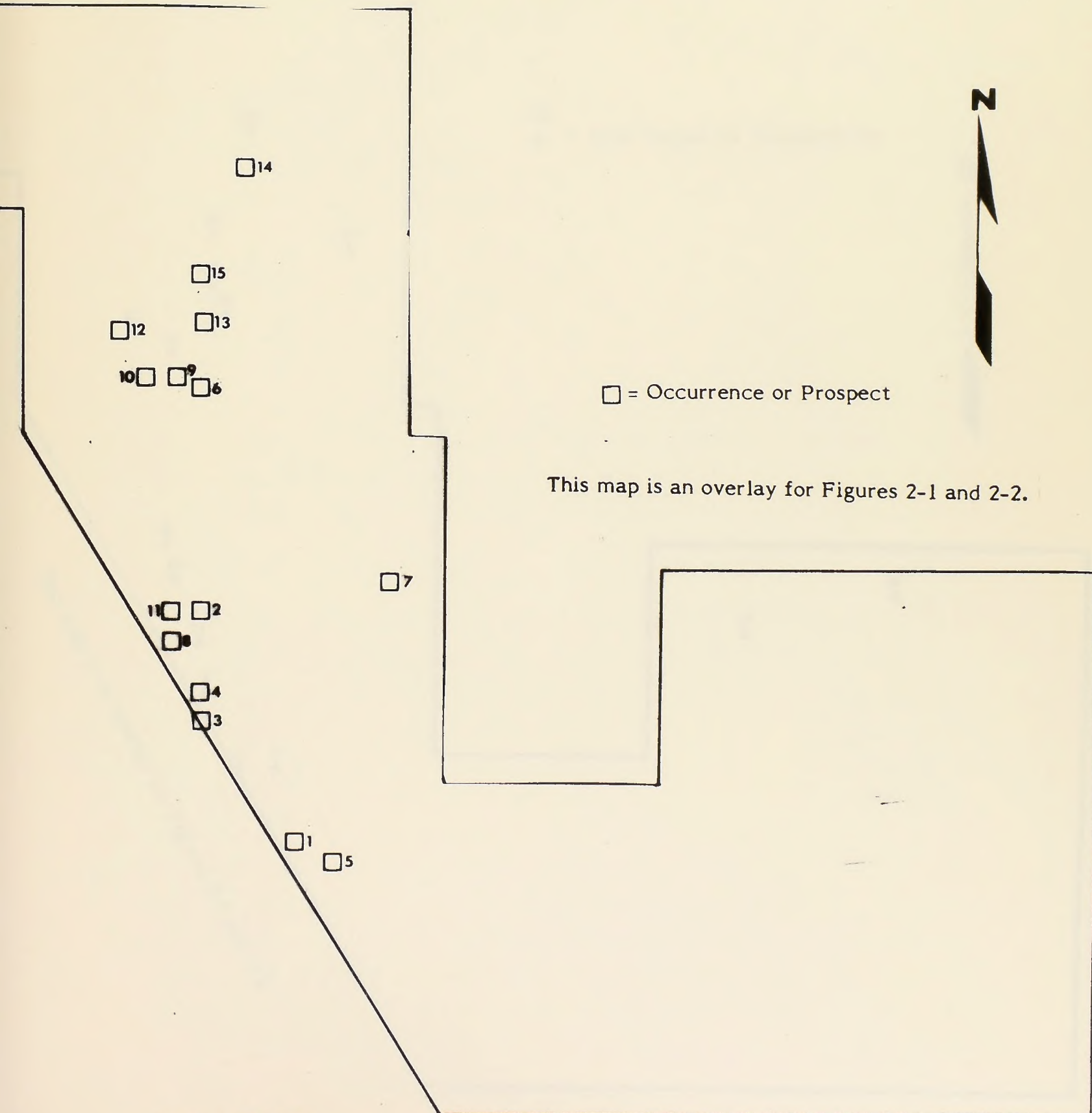
3.4 LEASES

A small portion of the eastern part of WSA 2-83 is currently leased or under lease application for oil and gas. Lease information is current as of 15 August, 1982.



FIGURE 3-1

CRIB Localities Map
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon
(See Appendix B)



Scale 1:250,000
(Adel 1°x2° NTMS Quadrangle)



FIGURE 3-2

MILS Localities Map
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon
(See Appendix C)

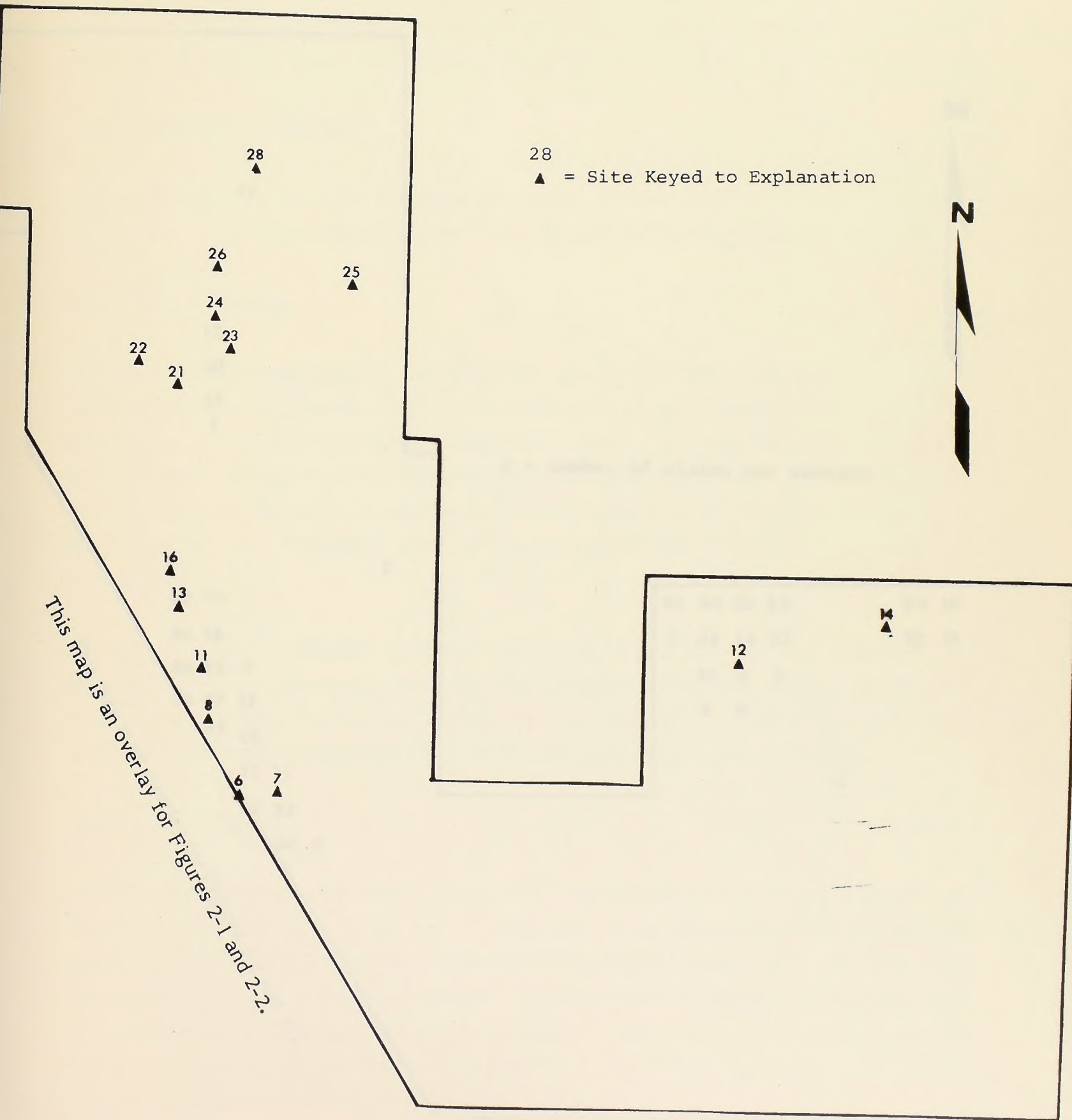
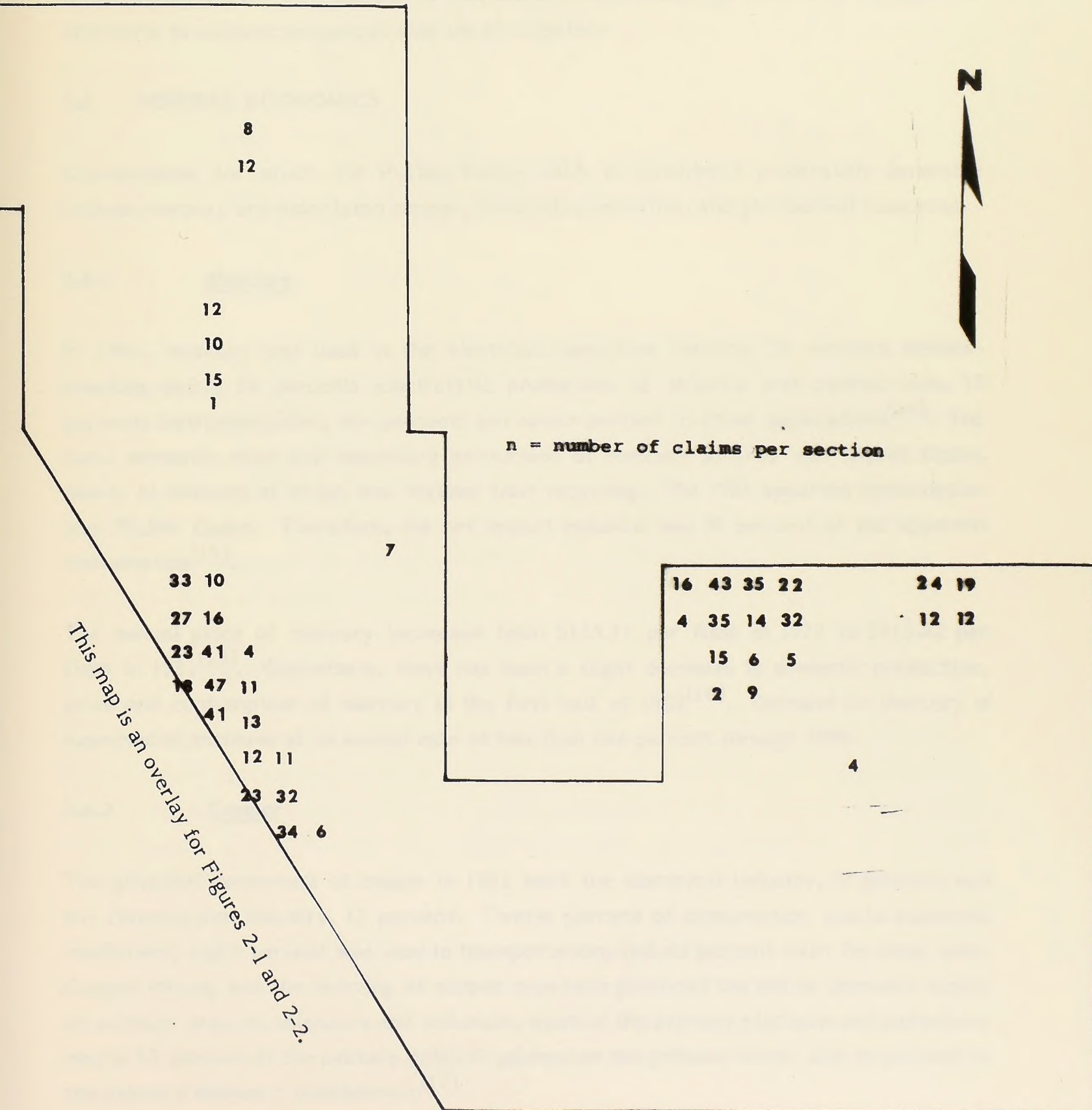


FIGURE 3-3

Claims Density Map
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon



Scale 1:250,000
(Adel 1°x2° NTMS Quadrangle)



3.5 DEPOSIT TYPES

Anticipated deposit types in the Pueblo Valley GRA are typical hydrothermal vein and disseminated bodies with associated silicification and bleaching. Stratiform deposits of diatomite in volcanic sequences also are anticipated.

3.6 MINERAL ECONOMICS

Commodities for which the Pueblo Valley GRA is considered moderately favorable include mercury and associated copper, diatomite, bentonite, and geothermal resources.

3.6.1 Mercury

In 1981, mercury was used in the electrical apparatus industry, 56 percent; mildew-proofing paint, 14 percent; electrolytic production of chlorine and caustic soda, 13 percent; instrumentation, ten percent; and seven percent in other applications⁽¹⁴⁾. The total domestic mine and secondary production of mercury in 1981 was 39,148 flasks, nearly 11 percent of which was derived from recycling. The 1981 apparent consumption was 59,244 flasks. Therefore, the net import reliance was 39 percent of the apparent consumption⁽¹⁴⁾.

The annual price of mercury increased from \$135.71 per flask in 1977 to \$413.82 per flask in 1981⁽¹⁵⁾. Conversely, there has been a slight decrease in domestic production, price and consumption of mercury in the first half of 1982⁽¹⁶⁾. Demand for mercury is expected to increase at an annual rate of less than one percent through 1990.

3.6.2 Copper

The principal consumers of copper in 1981 were the electrical industry, 57 percent; and the construction industry, 17 percent. Twelve percent of consumption was in industrial machinery; eight percent was used in transportation, and six percent went for other uses. Copper mining and the refining of copper ores have produced the entire domestic supply of primary arsenic, selenium, and tellurium, most of the primary platinum and palladium, nearly 43 percent of the primary gold, 37 percent of the primary silver, and 30 percent of the primary domestic molybdenum⁽¹⁷⁾.

Domestic production of copper fell six percent in July, 1982, whereas net imports declined 17 percent in the same month. This is 14 percent below the July, 1981 level⁽¹⁸⁾.

Consumption of refined copper decreased 24 percent while stockpiles have increased six percent. The price of copper reached an all time high of \$1.45 per pound in February, 1980. Although the price has fluctuated, it has declined steadily to around \$0.63 to \$0.71 per pound in August, 1982⁽¹⁹⁾.

The United States demand for copper is expected to increase at an annual rate of about three percent through 1990⁽¹⁸⁾. The United States is estimated to have a net import reliance of five percent of apparent copper consumption, as of January, 1982.

3.6.3 Diatomite

Diatomite is used primarily as a filter-aid, as an industrial filler, and other miscellaneous applications, including insulation⁽²⁰⁾. Diatomite was produced by seven companies in four states in 1981⁽²¹⁾. California accounted for more than 50 percent of total diatomite production. The United States is the largest world producer and consumer of diatomite. The United States also is a net exporter of this commodity. Demand for diatomite is expected to increase at an annual rate of three percent through 1990. World resources of diatomite are adequate for the foreseeable future, but the need for near-market sources will encourage development of new sources.

3.6.4 Bentonite

The primary uses of bentonite are in drilling mud, foundry sand, Portland cement, filtrates, pond and reservoir sealing, and for pelletizing (iron ore). Wyoming, Montana, and California are the chief producers of high-swelling, or sodium, bentonites. Missouri, Pennsylvania, and Ohio are the chief producers of low-swelling, or calcium, bentonites⁽²²⁾.

The United States is a net exporter of all clays. The demand for all clays is expected to increase at an annual rate of between two percent and four percent through 1990. The United States position as a major supplier of clays is enhanced by the possession of more than adequate resources and the technology necessary to process large amounts of high-quality clays⁽²³⁾.



3.6.5

Geothermal

Geothermal resources may be classified into two general categories; low-temperature resources (96°F to 196°F), and high-temperature resources (196°F to 302°F). Uses of low-temperature geothermal resources include local industrial, agricultural, and domestic heating applications. High-temperature geothermal resources currently are used only in limited commercial electrical generation and research applications. Supply, demand, and price data are not established for this resource because of the limited amount of production. The importance of geothermal resources is generally of a local nature⁽¹⁰⁾.

3.7 STRATEGIC AND CRITICAL MINERALS AND METALS

Mercury and copper are the only strategic commodities for which the Pueblo Valley GRA is considered favorable. (See Table 3-4 in TERRADATA's report entitled "Procedures for the Assessment of Geology, Energy, and Minerals (GEM) Resources.") The Pueblo Valley GRA has different degrees of favorability for mercury and copper.



4. CLASSIFICATION OF LAND FOR GEM RESOURCES POTENTIAL

The precise location of specific favorable environments within a given GRA depends upon three principal factors:

- o The precision and specificity of available data;
- o The nature (size and spatial distribution) of anticipated deposits as predicted from known models; and
- o The geometry of the favorable geologic environments.

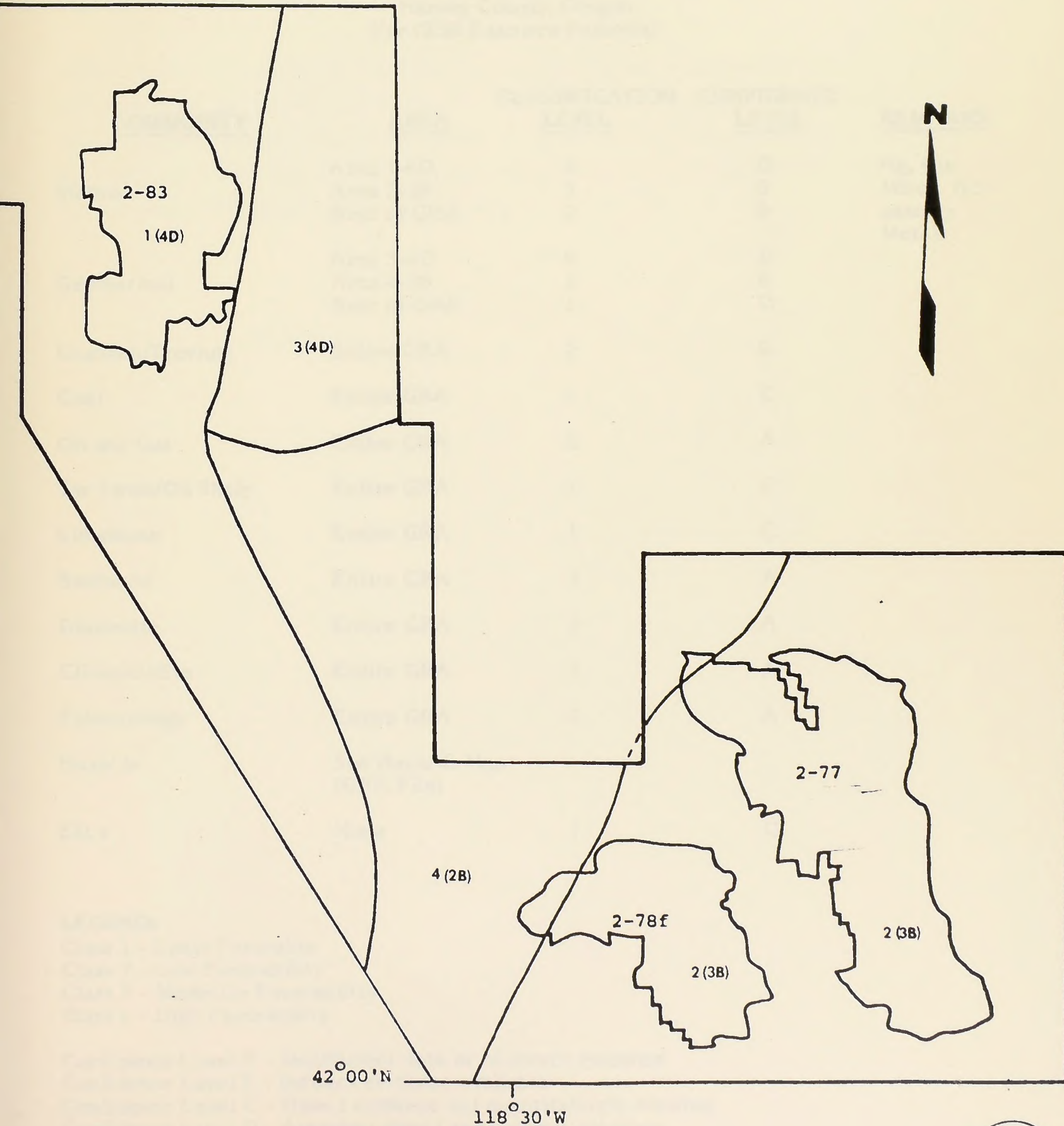
Commodity-specific information in the Pueblo Valley GRA is limited. Sub-surface information is virtually non-existent. Therefore, with the exception of metals and geothermal resources, the entire area, rather than specific subareas, has been classified for individual GEM resources (Figure 4-1 and Table 4-1).

The Pueblo Valley GRA contains several geologic environments that are variously favorable for GEM resources. Parts of the study area are classified 4D and 3B for the occurrence of mercury deposits. The 4D rating for WSA 2-83 (Area 1-4D) signifies that the geologic environment, the inferred geologic processes, the reported mines, and the mineral occurrences indicate high favorability for the accumulation of mercury, and associated copper, and that the available data provide abundant direct evidence to support the possible existence of mineral resources (see Land Classification Map, below). WSAs 2-77 and 2-78F (Area 2-3B) are classified 3B for potential mercury deposits because there is not enough direct evidence to warrant a higher classification. Two subareas of the GRA (Area 3-4D and Area 4-2B) are classified favorable for the occurrence of geothermal resources in accordance with the BLM classification scheme. All three WSAs contain environments that have low favorability (Class 2B) for the occurrence of uranium resources. The Pike Creek Formation is generally favorable for uranium throughout the Pueblo Valley GRA. Tertiary outflow facies of the nearby McDermitt Caldera are favorable for uranium resources in the southeastern part of the GRA.

The study area also contains environments similar to those found in other Tertiary basins in which diatomite and bentonite deposits occur. The confidence level (A) for the classification (3) of the area for potential diatomite and bentonite resources signifies that although the necessary geologic environment is believed to be present, there is minimal direct evidence to support or refute this evaluation. The entire Pueblo Valley GRA has low favorability (Class 2A) for oil and gas, clinoptilolite, and paleontological resources.

FIGURE 4-1

Land Classification Map
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon



Scale 1:250,000
(Adel 1°x2° NTMS Quadrangles)



TABLE 4-1

**Classification Of Lands Within The
Pueblo Valley GRA
(OR - 020 - 21)
Harney County, Oregon
For GEM Resource Potential**

<u>COMMODITY</u>	<u>AREA</u>	<u>CLASSIFICATION LEVEL</u>	<u>CONFIDENCE LEVEL</u>	<u>REMARKS</u>
Metals	Area 1-4D	4	D	Hg, Cu, Minor Ac- cessory Metals
	Area 2-3B	3	B	
	Rest of GRA	2	B	
Geothermal	Area 3-4D	4	D	
	Area 4-2B	2	B	
	Rest of GRA	1	D	
Uranium/Thorium	Entire GRA	2	B	
Coal	Entire GRA	1	C	
Oil and Gas	Entire GRA	2	A	
Tar Sands/Oil Shale	Entire GRA	1	C	
Limestone	Entire GRA	1	C	
Bentonite	Entire GRA	3	A	
Diatomite	Entire GRA	3	A	
Clinoptilolite	Entire GRA	2	A	
Paleontology	Entire GRA	2	A	
Hazards	See Hazards Map (GRA File)			
ESLs	None	1	C	

LEGEND:

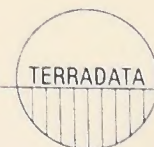
Class 1 - Least Favorable
Class 2 - Low Favorability
Class 3 - Moderate Favorability
Class 4 - High Favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence



The Pueblo Valley GRA does not exhibit favorable characteristics (Class 1) for the occurrence of other GEM resources (Table 4-1). Confidence levels of the Class 1 evaluations range from A to C depending upon the quantity and quality of available direct or indirect evidence.

TERRADATA's evaluation of the Pueblo Valley GRA agrees with the USGS evaluation of the same area for leasable commodities^(24, 25, 26), with the exception of saline minerals. The potassium, sodium, and borate potential of the Pueblo Valley GRA playa was not evaluated due to the lack of sufficient sub-surface information. None of the WSAs in the Pueblo Valley GRA occur in the valley proper.



5. RECOMMENDATIONS FOR FUTURE WORK

TERRADATA recommends that further surface geologic investigations be undertaken in the Pueblo Valley GRA in order to increase confidence levels in the classifications. Detailed geologic mapping and geochemical investigations would be useful in upgrading the land classifications of this area. Selective drilling of geochemical and/or geophysical anomalous areas would contribute to the refinement of the confidence levels and favorability ratings in this GRA. At the very least, all MILS localities, CRIB localities, NURE-related occurrences, and claims that are within the three WSAs should be examined in detail prior to making any final land-use decisions.



APPENDIX A -

- APPENDIX A -

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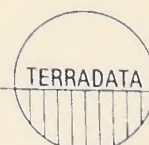


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- APPENDIX B -

Legend For Figure 3-1



FIGURE 3-1
(Continued)

Legend For
CRIB Localities Map
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon

1. CRIB No.: M020001
Location Name: Ferns, MarPueblo Group
Latitude: 42°06'15" N
Longitude: 118°37'40" W
Commodities: Hg, Au, Cu, Ag
Production: None
Production Size: Not Applicable
References: Brooks, H.C.; 1963; Quicksilver in Oregon, ODGMI Bulletin 55, pp.202.

Williams, H., and Compton, R.R.; 1953; Quicksilver Deposits of Steens Mountain and Pueblo Mountain, Southeast Oregon; USGS Bulletin 995-B, pp.49.

Brooks, H.C., and Ramp, L.; 1968; Gold and Silver in Oregon; ODGMI Bulletin 61, pp.161.

Anonymous; Mercury in Oregon; USBM Information Circular 8252, pp.331.
15. CRIB No.: M020003
Location Name: Ferns, Mareldorado Group
Latitude: 42°20'39" N
Longitude: 118°32'36" W
Commodities: Hg, Cu
Production: None
Production Size: Not Applicable
References: Williams, H., and Compton, R.R.; 1953; Quicksilver Deposits of Steens Mountain and Pueblo Mountain, Southeast Oregon; USGS Bulletin 995-B, pp.68.

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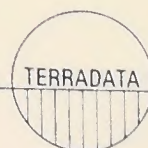


FIGURE 3-1
(Continued)

Legend For
CRIB Localities Map
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon

5. CRIB No.: M029015
Location Name: Walker, G.E.
Latitude: 42°06'00" N
Longitude: 118°36'00" W
Commodities: None Listed in CRIB
Production: None
Production Size: Not Applicable
References: Schafer, Max; 1956; Uranium Prospects in Oregon; ODGMI
Ore Bin.
5. CRIB No.: M029016
Location Name: Walker, G.E.
Latitude: 42°06'00" N
Longitude: 118°36'00" W
Commodities: U, Hg
Production: None
Production Size: Not Applicable
References: Schafer, Max; 1956; Uranium Prospects in Oregon; ODGMI,
Ore Bin.
1. CRIB No.: M029017
Location Name: Walker, G.E.
Latitude: 42°06'45" N
Longitude: 118°37'40" W
Commodities: U, Hg
Production: None
Production Size: Not Applicable
References: Schafer, Max; 1956; Uranium Prospects in Oregon; ODGMI,
Ore Bin.

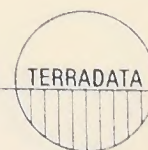


FIGURE 3-1
(Continued)

**Legend For
CRIB Localities Map
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon**

6. CRIB No.: M054928
Location Name: Peterson, Yellow Jacket
Latitude: $42^{\circ}17'55''$ N
Longitude: $118^{\circ}40'24''$ W
Commodities: Hg
Production: None
Production Size: Not Applicable
References: Anonmous; Mercury in Oregon; USBM Information Circular 8252.

7. CRIB No.: M054931
Location Name: Peterson, South O'Keefe
Latitude: $42^{\circ}12'56''$ N
Longitude: $118^{\circ}34'08''$ W
Commodities: Hg
Production: None
Production Size: Not Applicable
References: Anonamous; Mercury in Oregon; USBM Information Circular 8252.

Frederick, F.; 1945; State of Oregon Map Showing Location of Quicksilver Deposits; ODGMI, Scale 1:1,000,000.

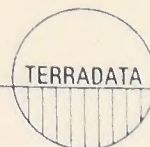


FIGURE 3-1
(Continued)

Legend For
CRIB Localities Map
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon

1. CRIB No.: M054953
Location Name: Peterson, Farnham
Latitude: 42°06'21" N
Longitude: 118°37'40" W
Commodities: Ag, Cu
Production: Yes
Production Size: Small
References: Brooks, H.C.; 1963; Quicksilver in Oregon; ODGMI, Bulletin 55, 223p.

Anonomous; Mercury in Oregon; USBM Information Circular 8252.

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3. CRIB No.: M054954
Location Name: Peterson, Cash Group
Latitude: 42°09'30" N
Longitude: 118°40'05" W
Commodities: Hg, Cu
Production: None
Production Size: Not Applicable
References: Brooks, H.C.; 1963; Quicksilver in Oregon; ODMGI, Bulletin 55, 223p.

Bailey, E.H.; Personal Files; USGS.

Anonomous; Mercury in Oregon; USGM Information Circular 8252.

Frederick, F.; 1945; State of Oregon Map Showing Location of Quicksilver Deposits; ODGMI, Scale 1:1,000,000.

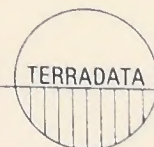


FIGURE 3-1
(Continued)

Legend For
CRIB Localities Map
Pueblo Valley GRA
(OR-021-20)
Harney County, Oregon

4. CRIB No.: M054955
Location Name: Peterson, Blue Bull
Latitude: 42°10'19" N
Longitude: 118°40'02" W
Commodities: Hg, Cu, As
Production: None
Production Size: Not Applicable
References: Brooks, H.C.; 1963; Quicksilver in Oregon; ODGMI, Bulletin 55, 223p.

Anonomous; Mercury in Oregon; USBM Information Circular 8252.

Frederick, F.; 1945; State of Oregon Map Showing Locations of Quicksilver Deposits; ODGMI, Scale 1:1,000,000.

Ross, C.P.; 1942; Quicksilver Deposits of the Steens and Pueblo Mountains, Southern Oregon; USGS Bulletin 931-J, pp.227-258.

Williams, H., and Compton, R.R.; 1953; Quicksilver Deposits of Steens Mountain and Pueblo Mountain, Southwestern Oregon; USGS Bulletin 955-B, pp.19-77.
2. CRIB No.: M054956
Location Name: Peterson, Rabbit Hole
Latitude: 42°12'09" N
Longitude: 118°40'09" W
Commodities: Hg, Cu, Ba
Production: Yes
Production Size: Small
References: Brooksm H.C.; 1963; Quicksilver in Oregon; ODGMI, Bulletin 55, 223p.

Anonomous; Mercury in Oregon; USBM Information Circular 8252.

Frederick, F.; 1945; State of Oregon Map Showing Location of Quicksilver Deposits; ODGMI, Scale 1:1,000,000.

Ross, C.P.; 1942; Quicksilver Deposits of the Steen and Pueblo Mountains, Southern Oregon; USGS Bulletin 931-J, pp.227-258.

Williams, H., and Compton, R.R.; 1953; Quicksilver Deposits of Steens Mountain and Pueblo Mountain, Southwestern Oregon, USGS Bulletin 955-B, pp.19-77.

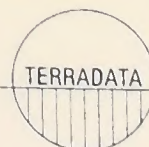


FIGURE 3-1
(Continued)

Legend For
CRIB Localities Map
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon

11. CRIB No.: M054957
Location Name: Peterson, Red King
Latitude: $42^{\circ}12'11''$ N
Longitude: $118^{\circ}41'14''$ W
Commodities: Hg, Cu
Production: None
Production Size: Not Applicable
References: Brooks, H.C.; 1963; Quicksilver in Oregon; ODGMI, Bulletin 55, 223p.

Williams H., and Compton, R.R.; 1953; Quicksilver Deposits of Steens Mountain and Pueblo Mountain, Southeast Oregon; USGS Bulletin 995-B, pp.55.

Ross, C.P., 1942; Quicksilver Deposits in the Steens and Pueblo Mountains, Southern Oregon; USGS Bulletin 931-J, pp.255.

9. CRIB No.: M054958
Location Name: Peterson, Nellie B.
Latitude: $42^{\circ}17'56''$ N
Longitude: $118^{\circ}41'33''$ W
Commodities: Hg
Production: None
Production Size: Not Applicable
References: Brooks, H.C.; 1963; Quicksilver in Oregon; ODGMI, Bulletin 55, 223p.

Anonamous; 1965; Mercury in Oregon; USBM Information Circular 8252

Frederick, F.; 1945; State of Oregon Map Showing Location of Quicksilver Deposits; ODGMI, Scale 1:1,000,000.

Williams, H., and Compton, R.R.; 1953; Quicksilver Deposits of Steens Mountain and Pueblo Mountain, Southwestern Oregon; USGS Bulletin 955-B, pp.19-77.

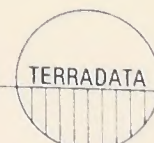


FIGURE 3-1
(Continued)

Legend For
CRIB Localities Map
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon

12. CRIB No.: M054959
Location Name: Peterson, O'Keefe
Latitude: 42°19'02" N
Longitude: 118°43'01" W
Commodities: Hg, Cu, Ba
Production: None
Production Size: Not Applicable
References: Brooks, H.C.; 1963; Quicksilver in Oregon; ODGMI, Bulletin 55, 223p.

Anonamous; 1965; Mercury in Oregon; USBM Information Circular 8252.

Ross, C.P.; 1942; Quicksilver Deposits of the Steens and Pueblo Mountains, Southern Oregon; USGS Bulletin 931-J, pp.227-258.

Williams, H., and Compton, R.R.; 1953; Quicksilver Deposits of Steens Mountain and Pueblo Mountain, Southwestern Oregon; USGS Bulletin 955-B, pp.19-77.

10. CRIB No.: M054960
Location Name: Peterson, Blair Group
Latitude: 42°18'13" N
Longitude: 118°42'47" W
Commodities: Hg, Ba
Production: None
Production Size: Not Applicable
References: Brooks, H.C.; 1963; Quicksilver in Oregon; ODGMI, Bulletin 55, 223p.

Anonamous; 1965; Mercury in Oregon; USBM Information Circular 8252.

Frederick, F.; 1945; State of Oregon Map Showing Location of Quicksilver Deposits; ODGMI, Scale 1:1,000,000.

Ross, C.P.; 1942; Quicksilver Deposits in the Steens and Pueblo Mountains, Southern Oregon; USGS Bulletin 931-J, pp.227-258.

Williams, H., and Compton, R.R.; 1953; Quicksilver Deposits of Steens Mountain and Pueblo Mountain, Southeast Oregon, USGS Bulletin 995-B, pp.62.



FIGURE 3-1
(Continued)

**Legend For
CRIB Localities Map
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon**

9. CRIB No.: M054962
Location Name: Peterson, Lucky Strike
Latitude: $42^{\circ}17'32''$ N
Longitude: $118^{\circ}41'53''$ W
Commodities: Hg, Au
Production: None
Production Size: Not Applicable
References: Brooks, H.C.; 1963; Quicksilver in Oregon; ODGMI, Bulletin 55, 223p.

Anonamous; 1965; Mercury in Oregon; USBM Information Circular 8252.

Frederick, F.; 1945; State of Oregon Map Showing Location of Quicksilver Deposits; ODGMI, Scale 1:1,000,000.

Ross, C.P.; 1942; Quicksilver Deposits of the Steens and Pueblo Mountains, Southern Oregon; USGS Bulletin 931-J, pp.227-258.

Williams, H., and Compton, R.R.; 1953; Quicksilver Deposits of Steens Mountain and Pueblo Mountain, Southwestern Oregon; USGS Bulletin 955-B, pp.19-77.
6. CRIB No.: M054963
Location Name: Peterson, Red Hill
Latitude: $42^{\circ}17'54''$ N
Longitude: $118^{\circ}40'17''$ W
Commodities: Hg
Production: None
Production Size: Unknown
References: Brooks, H.C.; 1963; Quicksilver in Oregon; ODGMI; Bulletin 55, 223p.

Anonamous; 1965; Mercury in Oregon; USBM Information Circular 8252.

Ross, C.P.; 1942; Quicksilver Deposits in the Steens and Pueblo Mountains, Southern Oregon; USGS Bulletin 931-J, 254p.

Williams, H., and Compton, R.R.; 1953; Quicksilver Deposits of Steens Mountain and Pueblo Mountain, Southeastern Oregon; USGS Bulletin 995-B, pp.66.

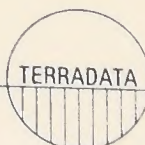


FIGURE 3-1
(Continued)

**Legend For
CRIB Localities Map
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon**

13. CRIB No.: M054964
Location Name: Peterson, Lucky Star, Red Dome & Fields Lode
Latitude: 42°19'21" N
Longitude: 118°40'33" W
Commodities: Hg, Cu, Ba
Production: None
Production Size: Not Applicable
References: Brooks, H.C.; 1963; Quicksilver in Oregon; ODGMI, Bulletin 55, 223p.

Anonamous; 1965; Mercury in Oregon; USBM Information Circular 8252

Frederick, F.; 1945; State of Oregon Map Showing Location of Quicksilver Depoists; ODGMI, Scale 1:1,000,000.

Williams, H., and Compton, R.R.; 1953; Quicksilver Deposits of Steens Mountain and Pueblo Mountain, Southwestern Oregon; USGS Bulletin 955-J, pp.19-77.
14. CRIB No.: M054965
Location Name: Peterson, Fisher, Regal & Sheepherder Claims
Latitude: 42°23'18" N
Longitude: 118°39'08" W
Commodities: Hg, Ba, Cu
Production: Yes
Production Size: Small
References: Brooks, H.C.; 1963; Quicksilve in Oregon; ODGMI, Bulletin 55, 223p.

Anonamous; 1965; Mercury in Oregon; USBM Information Circular 8252.

Frederick, F.; 1945; State of Oregon Map Showing Location of Quicksilver Deposits; ODGMI, Scale 1:1,000,000.

Ross, C.P.; 1942; Quicksilver Deposits of the Steens and Pueblo Mountains, Southern Oregon; USGS Bulletin 931-J, pp.227-258.

Williams, H., and Compton, R.R.; 1953; Quicksilver Deposits of Steens Mountain and Pueblo Mountain, Southwestern Oregon; USGS Bulletin 955-B, pp.19-77.



FIGURE 3-1
(Continued)

**Legend For
CRIB Localities Map
Pueblo Valley GRA
(OR-020-21)
Harney, County, Oregon**

8. CRIB No.: M054933
Location Name: Peterson, Red Hill
Latitude: $42^{\circ}11'39''$ N
Longitude: $118^{\circ}41'13''$ W
Commodities: Hg, Cu
Production: None
Production Size: Not Applicable
References: Anonamous; 1965; Mercury in Oregon; USBM Information Circular 8252.

Frederick, F.; 1945; State of Oregon Map Showing Location of Quicksilver Deposits; ODGMI, Scale 1:1,000,000.

1. CRIB No.: M054934
Location Name: Peterson, Pueblo Mining Co., Claims
Latitude: $42^{\circ}06'47''$ N
Longitude: $118^{\circ}37'41''$ W
Commodities: Hg
Production: None
Production Size: Not Applicable
References: Anonamous; 1965; Mercury in Oregon; USBM Information Circular 8252.

Frederick, F.; 1945; State of Oregon Map Showing Location of Quicksilver Deposits; ODGMI, Scale 1:1,000,000.



FIGURE 3-1
(Concluded)

**Legend For
CRIB Localities Map**

9. CRIB No.: M054936
Location Name: Peterson, Old Faithful No. 1
Latitude: $42^{\circ}17'56''$ N
Longitude: $118^{\circ}41'33''$ W
Commodities: Hg
Production: None
Production Size: Not Applicable
References: Anonamous; 1965; Mercury in Oregon; USBM Information Circular 8252.

Frederick, F.; 1945; State of Oregon Map Showing Location of Quicksilver Deposits; ODGMI, Scale 1:1,000,000.

2. CRIB No. M054938
Location Name: Peterson, McLean's Copper
Latitude: $42^{\circ}12'09''$ N
Longitude: $118^{\circ}40'09''$ W
Commodities: Hg
Production: None
Production Size: Not Applicable
References: Anonamous; 1965; Mercury in Oregon; USBM Information Circular 8252.

10. CRIB No.: M054942
Location Name: Peterson, Eileen
Latitude: $42^{\circ}17'57''$ N
Longitude: $118^{\circ}42'43''$ W
Commodities: Hg
Production: None
Production Size: Not Applicable
References: Anonamous; 1965; Mercury in Oregon; USBM Information Circular 8252.



- APPENDIX C -

Explanation For Figure 3-2



FIGURE 3-2
(Continued)

**Explanation For
MILS Localities Map
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon**

8
6 NAME- ARIZONA COPPER PROSPECT REFERENCE NUMBER- 0410250048
STATE- OREGON COUNTY- HARNEY ELEV:PREC- 1829M:500M
LATITUDE- N 42 07 45 PRECISION- 10KM
LONGITUDE- W 118 39 00 REFERENCE POINT- ORE BODY
UTM: ZONE 11N NORTHING 4665220 EASTING 363621
PUBLIC LAND SURVEY TOWNSHIP- 040 S RANGE- 035 E
DESCRIPTION SECTION- 06 SECTION SUBDIVISION-
RIVER BASIN- 67M MALHEUR&HARNEY LK BS DOMAIN- BLM ADMIN
STATUS- EXP PROSPECT OPERATION TYPE- PROSPECT
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE- 21.016
PRIMARY NAME- ARIZONA COPPER PROSPECT
COMMOD/MOD- COPPER

9
6 NAME- GLORIA MERCURY PROSPECT REFERENCE NUMBER- 0410250044
STATE- OREGON COUNTY- HARNEY ELEV:PREC- 2133M:500M
LATITUDE- N 42 07 36 PRECISION- 1KM
LONGITUDE- W 118 39 01 REFERENCE POINT- APPROX
UTM: ZONE 11N NORTHING 4664943 EASTING 363594
PUBLIC LAND SURVEY TOWNSHIP- 040 S RANGE- 035 E
DESCRIPTION SECTION- 06 SECTION SUBDIVISION-
RIVER BASIN- 67M MALHEUR&HARNEY LK BS DOMAIN- UNKNOWN
STATUS- EXP PROSPECT OPERATION TYPE- PROSPECT
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE- 42.019
PRIMARY NAME- GLORIA MERCURY PROSPECT
COMMOD/MOD- MERCURY

10
7 NAME- FARNHAM REFERENCE NUMBER- 0410250039
STATE- OREGON COUNTY- HARNEY ELEV:PREC- 1830M:500M
LATITUDE- N 42 07 00 PRECISION- 1KM
LONGITUDE- W 118 37 45 REFERENCE POINT- MAIN ENI
UTM: ZONE 11N NORTHING 4663799 EASTING 365317
PUBLIC LAND SURVEY TOWNSHIP- 040 S RANGE- 035 E
DESCRIPTION SECTION- 01 SECTION SUBDIVISION- SE
RIVER BASIN- 67M MALHEUR&HARNEY LK BS DOMAIN- BLM ADMIN
STATUS- PAST PRODUCER OPERATION TYPE- UNDERGROUND
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- WFOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE- 21.038
PRIMARY NAME- FARNHAM
OTHER NAMES- COONEY
PUEBLO
COMMOD/MOD- COPPER SULFIDE GOLD SILVER
SILVER MERCURY
BROOKS, H.G., 1963, QUICKSILVER IN OREGON: ORE. DEPT. GEOL. BULL 55, 223 P
ROSS, C.P., 1942, QUICKSILVER DEP. IN STEELNS MTNS: US GEOL. SURVLY B 931J
WALKER, G.W. & REPPENING, C.A., 1965, GEOLOGIC MAP ADEL QUAD: USGS MAP 1446
WILLIAMS, H. & COMPTON, R.R., 1953, QUICKSILVER DEP. STEELNS MTNS: USGS B995B



**FIGURE 3-2
(Continued)**

**Explanation For
MILS Localities Map
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon**

11
7 NAME- PUEBLO MTN LIMESTONE REFERENCE NUMBER- 0410250005
STATE- OREGON COUNTY- HARNEY ELEV:PREC- 1676M:500M
LATITUDE- N 42 07 44 PRECISION- 500M
LONGITUDE- W 118 37 45 REFERENCE POINT- APPROX
UTM: ZONE 11N NORTHING 4665156 EASTING 365343
PUBLIC LAND SURVEY TOWNSHIP- 040 S RANGE- 035 E
DESCRIPTION SECTION- 05 SECTION SUBDIVISION-
RIVER BASIN- 67M MALHEUR&HARNEY LK BS DOMAIN- UNKNOWN
STATUS- UNKNOWN OPERATION TYPE- UNKNOWN
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE-
PRIMARY NAME- PUEBLO MTN LIMESTONE
COMMOD/MOD- STONE LIMESTONE DM STONE LIMESTONE CB

12
8 NAME- BLUE BULL TUNNEL #1-2-3 REFERENCE NUMBER- 0410250051
STATE- OREGON COUNTY- HARNEY ELEV:PREC- 1585M:500M
LATITUDE- N 42 09 48 PRECISION- 1KM
LONGITUDE- W 118 40 21 REFERENCE POINT- ORE BODY
UTM: ZONE 11N NORTHING 4669050 EASTING 361836
PUBLIC LAND SURVEY TOWNSHIP- 039 S RANGE- 034 E
DESCRIPTION SECTION- 25 SECTION SUBDIVISION- NW
RIVER BASIN- 67M MALHEUR&HARNEY LK BS DOMAIN- BLM ADMIN
STATUS- EXP PROSPECT OPERATION TYPE- UNDERGROUND
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE- 21.068
PRIMARY NAME- BLUE BULL TUNNEL #1-2-3
COMMOD/MOD- COPPER SILVER

13
8 NAME- CASH GROUP REFERENCE NUMBER- 0410250038
STATE- OREGON COUNTY- HARNEY ELEV:PREC- 1646M:500M
LATITUDE- N 42 09 27 PRECISION- 500M
LONGITUDE- W 118 40 09 REFERENCE POINT- APPROX
UTM: ZONE 11N NORTHING 4668398 EASTING 362099
PUBLIC LAND SURVEY TOWNSHIP- 039 S RANGE- 034 E
DESCRIPTION SECTION- 25 SECTION SUBDIVISION-
RIVER BASIN- 67M MALHEUR&HARNEY LK BS DOMAIN- UNKNOWN
STATUS- EXP PROSPECT OPERATION TYPE- UNDERGROUND
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE-
PRIMARY NAME- CASH GROUP
COMMOD MOD- MERCURY COPPER



FIGURE 3-2
(Continued)

**Explanation For
MILS Localities Map
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon**

- 17
11 NAME- BLUE BULL MINE REFERENCE NUMBER- 0410250037
STATE- OREGON COUNTY- HARNEY ELEV:PREC- 1615M:500M
LATITUDE- N 42 10 43 PRECISION- 500M
LONGITUDE- W 118 40 24 REFERENCE POINT- APPROX
UTM: ZONE 11N NORTHING 4670718 EASTING 361801
PUBLIC LAND SURVEY TOWNSHIP- 039 S RANGE- 034 E
DESCRIPTION SECTION- 24 SECTION SUBDIVISION-
RIVER BASIN- 67M MALHEUR&HARNEY LK BS DOMAIN- UNKNOWN
STATUS- EXP PROSPECT OPERATION TYPE- UNDERGROUND
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE- 42.017
PRIMARY NAME- BLUE BULL MINE
COMMOD MOD- MERCURY
- 18
12 NAME- GEOTHERMAL WELL REFERENCE NUMBER- 0410450060
STATE- OREGON COUNTY- MALHEUR ELEV:PREC- 1402M:500M
LATITUDE- N 42 11 15 PRECISION- 1KM
LONGITUDE- W 118 22 40 REFERENCE POINT- APPROX
UTM: ZONE 11N NORTHING 4671299 EASTING 386227
PUBLIC LAND SURVEY TOWNSHIP- 039 S RANGE- 037 E
DESCRIPTION SECTION- 16 SECTION SUBDIVISION- N2
RIVER BASIN- 67M MALHEUR&HARNEY LK BS DOMAIN- UNKNOWN
STATUS- PRODUCER OPERATION TYPE- WELL
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE-
PRIMARY NAME- GEOTHERMAL WELL
COMMOD/MOD- GEOTHERMAL
USGS PROFESSIONAL PAPER 492
ON NORTH SIDE OF TROUT CREEK 0.5 MILE DOWNSTREAM FROM MOUTH
LITTLE TROUT CREEK. SEVERAL SPRINGS, WATER SUPPLY FOR CATTLE
- 19
13 NAME- RABBIT HOLE PROSPECT REFERENCE NUMBER- 0410250036
STATE- OREGON COUNTY- HARNEY ELEV:PREC- 1463M:500M
LATITUDE- N 42 12 09 PRECISION- 1KM
LONGITUDE- W 118 40 20 REFERENCE POINT- APPROX
UTM: ZONE 11N NORTHING 4673399 EASTING 361944
PUBLIC LAND SURVEY TOWNSHIP- 039 S RANGE- 034 E
DESCRIPTION SECTION- 12 SECTION SUBDIVISION-
RIVER BASIN- 67M MALHEUR&HARNEY LK BS DOMAIN- UNKNOWN
STATUS- EXP PROSPECT OPERATION TYPE- UNDERGROUND
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE-
PRIMARY NAME- RABBIT HOLE PROSPECT
COMMOD MOD- MERCURY COPPER

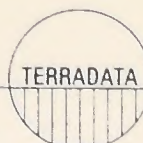
FIGURE 3-2
(Continued)

**Explanation For
MLS Localities Map
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon**

20
13 NAME- RED RING PROSPECT REFERENCE NUMBER- 0410250035
STATE- OREGON COUNTY- HARNEY ELEV:PREC- 1524M:500M
LATITUDE- N 42 12 13 PRECISION- 1KM
LONGITUDE- W 118 41 16 REFERENCE POINT- APPROX
UTM: ZONE 11N NORTHING 4673548 EASTING 360663
PUBLIC LAND SURVEY TOWNSHIP- 039 S RANGE- 034 E
DESCRIPTION SECTION- 11 SECTION SUBDIVISION- S2
RIVER BASIN- 67M MALHEUR&HARNEY LK BS DOMAIN- UNKNOWN
STATUS- EXP PROSPECT OPERATION TYPE- UNDERGROUND
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE-
PRIMARY NAME- RED RING PROSPECT
COMMOD/MOD- MERCURY COPPER

21
14 NAME- TROUT CREEK DIATOMITE REFERENCE NUMBER- 0410250010
STATE- OREGON COUNTY- HARNEY ELEV:PREC- 1615M:500M
LATITUDE- N 42 12 18 PRECISION- 500M
LONGITUDE- W 118 17 51 REFERENCE POINT- ORE BODY
UTM: ZONE 11N NORTHING 4673138 EASTING 392885
PUBLIC LAND SURVEY TOWNSHIP- 039 S RANGE- 038 E
DESCRIPTION SECTION- 07 SECTION SUBDIVISION- C L2
RIVER BASIN- 67M MALHEUR&HARNEY LK BS DOMAIN- BLM ADMIN
STATUS- RAW PROSPECT OPERATION TYPE- PROSPECT
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE-
PRIMARY NAME- TROUT CREEK DIATOMITE
COMMOD/MOD- DIATOMITE

23
16 NAME- HARMONY GROUP REFERENCE NUMBER- 0410250100
STATE- OREGON COUNTY- HARNEY ELEV:PREC- 1509M:500M
LATITUDE- N 42 13 15 PRECISION- 500M
LONGITUDE- W 118 41 35 REFERENCE POINT- APPROX
UTM: ZONE 11N NORTHING 4675448 EASTING 360265
PUBLIC LAND SURVEY TOWNSHIP- 039 S RANGE- 034 E
DESCRIPTION SECTION- 02 SECTION SUBDIVISION- NWNW
RIVER BASIN- 67M MALHEUR&HARNEY LK BS DOMAIN- NAT FOREST
STATUS- RAW PROSPECT OPERATION TYPE- SURF-UNDERG
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE-
PRIMARY NAME- HARMONY GROUP
COMMOD/MOD- MERCURY COPPER
USGS BULLETIN 931-J P255 (1942)
SEE USGS BULLETIN 995-B P57(1953)



**Explanation For
MILS Localities Map
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon**

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30
21 NAME- MOGUL MINE                REFERENCE NUMBER- 0410250031
STATE- OREGON                      ELEV:PREC- 1524M:500M
COUNTY- HARNEY
LATITUDE- N 42 18 04              PRECISION- 500M
LONGITUDE- W 118 42 15            REFERENCE POINT- APPROX
UTM: ZONE 11N NORTHING 4684401    EASTING 359526
PUBLIC LAND SURVEY TOWNSHIP- 037 S RANGE- 032 E
DESCRIPTION SECTION- 25 SECTION SUBDIVISION-
RIVER BASIN- OTM MALHEURSHARNEY LK BS DOMAIN- UNKNOWN
STATUS- DEVEL DEPOSIT OPERATION TYPE- UNDERGROUND
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE-
PRIMARY NAME- MOGUL MINE
COMMOD/MOD- MERCURY COPPER
BROOKS H.C. 1963.QUICKSILVER IN OREGON:ORE DEPT.GEOL.BULL
55P.198-200

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FIGURE 3-2
(Continued)

**Explanation For
MILS Localities Map
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon**

31
21 NAME- NELLIE B GROUP REFERENCE NUMBER- 0410250034
STATE- OREGON COUNTY- HARNEY ELEV:PREC- 1768M:500M
LATITUDE- 42 18 08 PRECISION- 500M
LONGITUDE- W 118 41 13 REFERENCE POINT- APPROX
UTM: ZONE 11N NORTHING 4684106 EASTING 360048
PUBLIC LAND SURVEY TOWNSHIP- 037 S RANGE- 032+E
DESCRIPTION SECTION- 25 SECTION SUBDIVISION-
RIVER BASIN- 67M MALHEUR&HARNEY LK BS DOMAIN- UNKNOWN
STATUS- EXP PROSPECT OPERATION TYPE- PROSPECT
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE-
PRIMARY NAME- NELLIE B GROUP
OTHER NAMES- CRIMSON ROSE
WHITE PICK
BLUE BOY GROUP
COMMOD/MOD- MERCURY

32
22 NAME- BLAIR GROUP REFERENCE NUMBER- 0410250032
STATE- OREGON COUNTY- HARNEY ELEV:PREC- 1524M:500M
LATITUDE- 42 18 15 PRECISION- 500M
LONGITUDE- W 118 42 50 REFERENCE POINT- APPROX
UTM: ZONE 11N NORTHING 4684755 EASTING 358732
PUBLIC LAND SURVEY TOWNSHIP- 037 S RANGE- 032+E
DESCRIPTION SECTION- 25 SECTION SUBDIVISION- N2
RIVER BASIN- 67M MALHEUR&HARNEY LK BS DOMAIN- UNKNOWN
STATUS- EXP PROSPECT OPERATION TYPE- UNDERGROUND
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE-
PRIMARY NAME- BLAIR GROUP
COMMOD/MOD- MERCURY COPPER

33
22 NAME- O'KEEFE CLAIMS REFERENCE NUMBER- 0410250033
STATE- OREGON COUNTY- HARNEY ELEV:PREC- 1585M:500M
LATITUDE- 42 18 34 PRECISION- 500M
LONGITUDE- W 118 43 06 REFERENCE POINT- APPROX
UTM: ZONE 11N NORTHING 4685319 EASTING 358377
PUBLIC LAND SURVEY TOWNSHIP- 037 S RANGE- 032+E
DESCRIPTION SECTION- 23 SECTION SUBDIVISION- NW
RIVER BASIN- 67M MALHEUR&HARNEY LK BS DOMAIN- UNKNOWN
STATUS- EXP PROSPECT OPERATION TYPE- PROSPECT
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE-
PRIMARY NAME- O'KEEFE CLAIMS
COMMOD/MOD- MERCURY COPPER



FIGURE 3-2
(Continued)

Explanation For
MLS Localities Map
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon

34
23 NAME- FIELDS LOPE GROUP REFERENCE NUMBER- 0410250028
STATE- OREGON COUNTY- HARNEY ELEV:PREC- 1280M:500M
LATITUDE- N 42 18 37 PRECISION- 500M
LONGITUDE- W 118 39 48 REFERENCE POINT- APPROX
UTM: ZONE 11N NORTHING 4685361 EASTING 362912
PUBLIC LAND SURVEY TOWNSHIP- 037 S RANGE- 033 E
DESCRIPTION SECTION- 19 SECTION SUBDIVISION-
RIVER BASIN- 67M MALHEUR&HARNEY LK BS DOMAIN- UNKNOWN
STATUS- EXP PROSPECT OPERATION TYPE- PROSPECT
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- WFOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE-
PRIMARY NAME- FIELDS LOPE GROUP
COMMOD/MOD- MERCURY

35
23 NAME- RED HILL CLAIMS REFERENCE NUMBER- 0410250029
STATE- OREGON COUNTY- HARNEY ELEV:PREC- 1341M:500M
LATITUDE- N 42 17 56 PRECISION- 500M
LONGITUDE- W 118 39 45 REFERENCE POINT- APPROX
UTM: ZONE 11N NORTHING 4684085 EASTING 362956
PUBLIC LAND SURVEY TOWNSHIP- 037 S RANGE- 033 E
DESCRIPTION SECTION- 30 SECTION SUBDIVISION-
RIVER BASIN- 67M MALHEUR&HARNEY LK BS DOMAIN- UNKNOWN
STATUS- EXP PROSPECT OPERATION TYPE- PROSPECT
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- WFOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE-
PRIMARY NAME- RED HILL CLAIMS
COMMOD/MOD- MERCURY

36
24 NAME- LUCKY STAR GROUP REFERENCE NUMBER- 0410250026
STATE- OREGON COUNTY- HARNEY ELEV:PREC- 1646M:500M
LATITUDE- N 42 18 25 PRECISION- 500M
LONGITUDE- W 118 40 22 REFERENCE POINT- APPROX
UTM: ZONE 11N NORTHING 4686848 EASTING 362163
PUBLIC LAND SURVEY TOWNSHIP- 037 S RANGE- 033 E
DESCRIPTION SECTION- 18 SECTION SUBDIVISION-
RIVER BASIN- 67M MALHEUR&HARNEY LK BS DOMAIN- UNKNOWN
STATUS- EXP PROSPECT OPERATION TYPE- PROSPECT
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE-
PRIMARY NAME- LUCKY STAR GROUP
COMMOD/MOD- MERCURY

FIGURE 3-2
(Continued)

Explanation For
MILS Localities Map
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon

37
24 NAME- RED DOVE GROUP REFERENCE NUMBER- 0410250027
STATE- OREGON COUNTY- HARNEY ELEV:PREC- 1646M:500M
LATITUDE- N 42 19 23 PRECISION- 500M
LONGITUDE- W 118 40 10 REFERENCE POINT- APPROX
UTM: ZONE 11N NORTHING 4686780 EASTING 362436
PUBLIC LAND SURVEY TOWNSHIP- 037 S RANGE- 033 E
DESCRIPTION SECTION- 18 SECTION SUBDIVISION-
RIVER BASIN- 67M MALHEUR&HARNEY LK BS DOMAIN- UNKNOWN
STATUS- EXP PROSPECT OPERATION TYPE- PROSPECT
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE-
PRIMARY NAME- RED DOVE GROUP
COMMOD/MOD- MERCURY COPPER

38
25 NAME- GEOTHERMAL WELL REFERENCE NUMBER- 0410250090
STATE- OREGON COUNTY- HARNEY ELEV:PREC- 1250M:500M
LATITUDE- N 42 20 18 PRECISION- 500M
LONGITUDE- W 118 35 50 REFERENCE POINT- APPROX
UTM: ZONE 11N NORTHING 4688363 EASTING 368419
PUBLIC LAND SURVEY TOWNSHIP- 037 S RANGE- 033 E
DESCRIPTION SECTION- 11 SECTION SUBDIVISION- SW
RIVER BASIN- 67M MALHEUR&HARNEY LK BS DOMAIN- UNKNOWN
STATUS- PRODUCER OPERATION TYPE- WELL
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE-
PRIMARY NAME- GEOTHERMAL WELL
OTHER NAMES- HEBENER ROCK PRODUCTS
COMMOD/MOD- GEOTHERMAL
USGS PROFESSIONAL PAPER 492
2 MILES SOUTH OF ALVORD LAKE. SEVERAL SPRINGS.

39
25 NAME- GEOTHERMAL WELL REFERENCE NUMBER- 0410250091
STATE- OREGON COUNTY- HARNEY ELEV:PREC- 1250M:500M
LATITUDE- N 42 19 45 PRECISION- 1KM
LONGITUDE- W 118 36 20 REFERENCE POINT- APPROX
UTM: ZONE 11N NORTHING 4687357 EASTING 367714
PUBLIC LAND SURVEY TOWNSHIP- 037 S RANGE- 033 E
DESCRIPTION SECTION- 19 SECTION SUBDIVISION-
RIVER BASIN- 67M MALHEUR&HARNEY LK BS DOMAIN- UNKNOWN
STATUS- PRODUCER OPERATION TYPE- WELL
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE-
PRIMARY NAME- GEOTHERMAL WELL
OTHER NAMES- EDWARD HINES LUMBER CO
COMMOD/MOD- GEOTHERMAL
USGS PROFESSIONAL PAPER 492
AT OLD BORAX WORKS 2.5 MILES SOUTH OF ALVORD LAKE. SEVERAL 5
WATER SUPPLY FOR ABANDONED BORAX WORKS.



FIGURE 3-2
(Concluded)

Explanation For
MILS Localities Map
Pueblo Valley GRA
(OR-020-21)
Harney County, Oregon

10
26 NAME- ELDORADO GROUP REFERENCE NUMBER- 0410250025
STATE- OREGON COUNTY- HARNEY ELEV:PREC- 1402M:500M
LATITUDE- N 42 20 38 PRECISION- 500M
LONGITUDE- W 118 40 20 REFERENCE POINT- APPROX
UTM: ZONE 11N NORTHING 4689008 EASTING 362253
PUBLIC LAND SURVEY TOWNSHIP- 037 S RANGE- 033 E
DESCRIPTION SECTION- 07 SECTION SUBDIVISION-
RIVER BASIN- GTM MALHEUR&HARNEY LK BS DOMAIN- UNKNOWN
STATUS- EXP PROSPECT OPERATION TYPE- PROSPECT
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE-
PRIMARY NAME- ELDORADO GROUP
COMMOD/MOD- MERCURY COPPER

42
28 NAME- FISHER & REGAL & SHEEPHERDER CLAIMS REFERENCE NUMBER- 0410250024
STATE- OREGON COUNTY- HARNEY ELEV:PREC- 1585M:500M
LATITUDE- N 42 23 05 PRECISION- 500M
LONGITUDE- W 118 39 10 REFERENCE POINT- APPROX
UTM: ZONE 11N NORTHING 4693601 EASTING 363943
PUBLIC LAND SURVEY TOWNSHIP- 036 S RANGE- 033 E
DESCRIPTION SECTION- 29 SECTION SUBDIVISION-
RIVER BASIN- GTM MALHEUR&HARNEY LK BS DOMAIN- UNKNOWN
STATUS- EXP PROSPECT OPERATION TYPE- PROSPECT
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- ADEL TYPE- 1:250K
1:250,000 MAP NAME- ADEL MINERAL PROPERTY FILE-
PRIMARY NAME- FISHER & REGAL & SHEEPHERDER CLAIMS
COMMOD/MOD- MERCURY COPPER

